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KALA AZAR.

ADLER (S.) & THEODOR (O.). **The Distribution of Sandflies and Leishmaniasis in Palestine, Syria and Mesopotamia.**—*Ann. Trop. Med. & Parasit.* 1929. June 27. Vol. 23. No. 2. pp. 269–306. With 1 plate, 9 figs. & 2 maps. [29 refs.] [Microbiol. Inst., Hebrew Univ., Jerusalem.]

From May 12th to October 20th 1928 the authors carried out a survey of sandflies of Mesopotamia, Syria and Transjordania and studied their distribution in relation to the incidence of leishmaniasis. The results are compared with the experiences they have had in Palestine. In addition to the known species of sandfly—*Phlebotomus papatasii, P. sergenti, P. major, P. chinensis, P. minutus* and its variety *niger, P. africanus* and *P. palestinensis*—there were discovered two new species which are named *P. baghdadis* and *P. iraqi* and an unnamed form related to *P. clydei*. Dissection of sandflies revealed the following parasites: (1) *Fungi*. In the coelom and ova of *P. papatasii* in Palestine and in this species and *P. sergenti* in Mesopotamia and Syria. Infected eggs are completely destroyed. (2) *Nematodes*. In the haemocoel of *P. papatasii* and *P. sergenti* in Baghdad. Eggs and hatched larvae were numerous and the latter pass into the ovary and may escape with the eggs when they probably invade the sandfly larvae. Several laboratory-bred flies were infected. (3) *Crithidia*. In five out of 78 specimens of *P. baghdadis* in Baghdad. The vertebrate host is probably the gecko. (4) *Mites*. Occasionally found attached to the abdomen of *P. papatasii* and *P. sergenti*. (5) *Sporozoa*. The oocyst probably of a species of hepatozoon was found in *P. papatasii* in Jericho in 1925. In addition flagellates of the leptomonas type were found in about 0·1 per cent. of *P. papatasii* in Jericho in 1925 and in two of 683 *P. sergenti* in Baghdad in 1928. As regards the former, inoculation into the skin of human beings produced oriental sore in three instances, so that the flagellates were undoubtedly *Leishmania tropica*. In the case of the latter, as far as present knowledge goes, they could have been derived only from man, dog or gecko.

The distribution of the sandflies and leishmaniasis is discussed at some length, and the authors arrive at the following conclusions, which are based partly on the capacity of strains of the parasite to develop in sandflies. Both *P. papatasii* and *P. sergenti* are carriers of oriental sore. In Baghdad the latter is the main carrier, in Jericho and Bar.

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Elias the former is the only carrier, while in Aleppo both are incriminated. There are, however, localities free from leishmaniasis in which both these sandflies occur. Peculiarities in the distribution of oriental sore result from variations in the infectivity of different strains of *L. tropica* for the sandfly.

The paper gives the diagnostic characters of the sandflies mentioned and details of their distribution in the areas surveyed.

C. M. Wenyon.

ARTAMONOFF (A. C.). Contribution à l'étude épidémiologique de la leishmaniose viscérale de l'Asie centrale. [**Epidemiology of Visceral Leishmaniasis in Central Asia.**]—*Russian Jl. Trop. Med.* 1929. Vol. 7. No. 4. pp. 205–217. With 4 text figs. [17 refs.] [In Russian. French summary pp. 217–218.] [Trop. Med. Station, Kokand.]

In Central Asia during the period 1924 to 1928 510 cases of kala azar have been noted. As a result of his own enquiries into 314 cases seen by himself during the same period, the author has arrived at the following conclusions. The centres for the disease follow the Central Asian railway from Kzil-aravat to Andijan and Tshimkent. It extends laterally from the great centres of Samarkand, Kokand and Andijan, in which it occurs chiefly in the sectors of the railway stations, and more frequently amongst Europeans than natives. Of the 314 cases, only 100 were in natives, a fact which may be explained by the more careful attention which was given to the European population. One-third of the cases were in children of 1 to 2 years of age, one-fifth in those of 2 to 3 years. The disease became less frequent with increase of age, so that for the age period 12 to 32 years only 16 cases were noted. In the European quarter of Samarkand, and in the railway station quarter of that town and Kokand, there was an annual incidence of 4 per cent. amongst children of 1 to 3 years of age. An examination of the habits of life of the people revealed no factor which could be regarded as influencing the incidence of the disease. As a result of blood grouping, there was found to be a greater incidence amongst group IV, but this is not peculiar to kala azar, and may indicate merely a greater susceptibility to disease in general. The cases are equally distributed throughout the year, with the exception of a slight increase in February. If the incubation period is considered to be four months, it would seem that transmission by sandflies will hardly explain the method of infection particularly with regard to the cases seen in April. There does not appear to be any relationship between the distribution of the human and canine diseases. The occurrence of the cutaneous disease in cases of kala azar, four instances of which have been reported, is suggestive of a difference between the viruses of the two diseases.

C. M. W.

ALEXANDRIDES (Karl). Ueber das Vorkommen von Kala-azar in Mazedonien. [**Occurrence of Kala Azar in Macedonia.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1929. Oct. Vol. 33. No. 10. pp. 542–544.

The occurrence of infantile kala azar in Macedonia was first noted by the author in 1925, when he diagnosed the disease in a case from Seres. Next year he saw a case from Drama and another from Salonika. He recorded

these cases in March 1927 in the *Salonikier medizinische Wochenschrift.* Since then other cases have been noted in the districts of Seres, Drama, Cavalla and Salonika. The details of four of these cases are given.

C. M. W.

NAPIER (Everard). Travaux de la Commission du kala-azar dans l'Inde Britannique en 1928. [**Work of the Kala Azar Commission in British India in 1928.**]—*Bull. Office Internat. d' Hyg. Publique.* 1929. May. Vol. 21. No. 5. pp. 778–781.

This is a short résumé of the kala azar investigations in India during 1928. All the information contained in it has been published with the exception of the statement that amongst the first 200 wild specimens of *Phlebotomus argentipes* which were dissected in Assam, seven were found to be infected with a flagellate morphologically identical with *Leishmania donovani.* Hitherto only one naturally infected fly has been recorded (this *Bulletin,* Vol. 24, p. 133), so that the reviewer is led to suspect that the statement may not be correct.

C. M. W.

STRUTHERS (Ernest B.). **Splenomegaly—the Diagnosis of Kala Azar.**—*China Med. Jl.* 1929. Aug. Vol. 43. No. 8. pp. 772–774.

The author emphasizes the importance of suspecting kala azar in all cases with enlargement of the spleen if they come from endemic foci of the disease, which in China comprise the provinces of Kiangsu, Anhwei, Honan, Shantung and Hopei, all north of the Yangtse River. He mentions cases which were admitted to hospital for such complaints as dysentery or gastric trouble, and others in which kala azar was suspected, and the parasites were discovered only after two or more punctures of the liver or spleen. One case was admitted with a tentative diagnosis of syphilis ; the condition was proved to be kala azar by discovery of parasites at the fourth spleen puncture. On the other hand, in an area like Shantung, nearly everyone with an enlarged spleen considers it to be the result of kala azar, and comes for treatment. Among these have been found cases of myeloid leukaemia, chronic infective endocarditis, malaria, syphilis, and splenic anaemia. An analysis of 60 cases of kala azar shows that, in order of frequency, the following are the most usual signs : enlargement of spleen, fever, loss of strength, bleeding from nose, bleeding from gums, emaciation, anorexia, cough, diarrhoea or dysentery, sweats, chills, abdominal discomfort, amenorrhoea, pigment spots, cancrum oris, stomach trouble.

C. M. W.

PRATES (Manuel Máximo). [In Portuguese & English.] Um caso de kala-azar. Diagnosticado em Moçambique numa criança portuguesa. Comunicado ao Congresso de Medicina Tropical do Cairo—Dezembro de 1928. **A Case of Kala-Azar diagnosed in a Portuguese Child in Mozambique.**—8 pp. With 2 figs. & 1 folding chart. 1928. Lourenço Marques.

A child which was taken from Portugal to Mozambique when nine and a half months old lived there in excellent health up to the age of 25 months when there was an attack of fever, which responded to quinine treatment. During the next three months the child was comparatively well and regained

its lost weight. Then there was further fever, which did not respond to quinine but which was modified by emetine injections. Kala azar was suspected and a laboratory examination confirmed this.

The disease is endemic in Portugal, but the long period of good health after leaving that country suggests a possible infection in Mozambique, where there are many Indian immigrants. Since this case was seen, others of a similar kind, which responded to tartar emetic but not to quinine, have been noted, so that it is possible that the disease is actually endemic in Mozambique. The first case, in which the diagnosis was made by discovery of leishmania, is now apparently cured as a result of 12 injections of stibosan.

C. M. W.

Umar (M.). **Kala-Azar in Bijnor.**—*Indian Med. Gaz.* 1929. June. Vol. 64. No. 6. pp. 322–323.

In this paper the author describes as kala azar, eight cases seen by him in Bijnor, United Provinces. In all cases the diagnosis was made clinically and by the application of the formol-gel and antimony tests. There was also response to antimony treatment. In an editorial note it is pointed out that as regards the distribution of the disease the actual finding of the parasite by experts is necessary before any place can be included in the list of endemic foci. A spleen smear and serum from one case were sent to the editor. There were no parasites in the smear, while the serum was not positive with the aldehyde test.

C. M. W.

Napier (L. Everard) & Haldar (K. C.). **A Case of Induced Polyleucocythaemia.**—*Indian Med. Gaz.* 1929. July. Vol. 64. No. 7. pp. 382–385. With 1 text fig. [1 ref.] [Calcutta School of Trop. Med. & Hyg., Calcutta.]

A Hindu male 28 years of age was admitted to hospital with kala azar of the ordinary type. He was given eight injections of neostibosan at intervals of 48 hours. As the fever continued up to the second week of treatment he was given cinchona febrifuge. After this the temperature fell to normal and did not rise again. Twelve days after the completion of the course of treatment a blood count showed 9,440 white cells per cmm. After another 12 days the count was 25,625. There was a steady increase up to 67,435 and, during the sixth week after treatment, to 144,375. There was a steady fall during the next 35 days to 31,600. The patient was discharged when the 30,000 mark was reached. At first the rise was due chiefly to polymorphonuclears, but subsequently it was brought about mainly by myelocytes. The case may have been one of myelosplenic leukaemia, which is not uncommon in Bengal, in which the condition was overshadowed by the leishmania infection. On the other hand, the condition may be one of the sequelae of kala azar or the antimony treatment.

C. M. W.

Cortés (Alonso F.). Los nueve primeros casos de leishmaniosis visceral diagnosticados en la provincia de Cádiz. [**The First Nine Cases of Visceral Leishmaniasis diagnosed in Province of Cadiz.**]—*Medicina Países Cálidos.* Madrid. 1929. July. Vol. 2. No. 4. pp. 352–358. With 9 figs. & 1 map in text. [3 refs.]

An account of nine cases of kala azar in children up to ten years of age which were brought to the antimalaria station at Arcos in the Province of Cadiz. Three of the cases originated in Arcos itself, the others in neighbouring towns. Treatment was carried out with stibenyl alone or this drug combined with Bayer 212.

C. M. W.

NAPIER (L. Everard) & MULLICK (M. N.). **The Intensive Treatment of Kala-Azar by Neostibosan; Part II.**—*Indian Med. Gaz.* 1929. June. Vol. 64. No. 6. pp. 314–315.

In a previous paper (this *Bulletin*, Vol. 26, p. 321) the authors described an intensive course of treatment for kala azar. This consisted in giving eight injections of neostibosan on eight consecutive days, the total amount of drug for an adult being 2·3 gm. The paper under review gives the subsequent history of the patients mentioned in the first paper. Three of the cases could not be traced and one died within six months of some other disease. Of the 26 remaining, three, or 11·5 per cent., are classed as relapses, while 23, or 88·5 per cent., were completely cured. Three of the cases had relapsed after a previous treatment, and of these one relapsed again. Of the 23 which had not been treated previously, two relapsed. The concentrated course has now been adopted as the routine treatment at the Carmichael Hospital for Tropical Diseases in Calcutta. At least 100 more patients have been treated in this way, and on only two occasions has it been necessary to modify the course. As it is likely that the method will be more widely adopted, the authors point out that in half the cases there was no clinical improvement till after the course was completed. It is not claimed that the results are better than the more protracted courses, but that from the point of view of the hospital beds there is a distinct advantage. It is possible that the method might be applied to out-patients, for the full course has been given to two laboratory assistants carrying on their ordinary duties. Though the cure rate is high with eight injections, it seems reasonable to suppose that it might be still higher with ten injections. In the series reported only one case was treated intramuscularly; the patient recovered. The method has now been adopted in about 20 cases and the results have been quite satisfactory. Doses of 0·3 gm. of neostibosan in a 25 per cent. solution in distilled water are injected into the gluteal or deltoid muscles. In only one instance out of about 200 injections was there inflammation followed by abscess formation.

C. M. W.

ROEHL (Wilhelm). **Chemotherapeutic Investigations with Antimony Preparations in the Experimental Kala-Azar of the Hamster.**—*Indian Med. Gaz.* 1929. Oct. Vol. 64. No. 10. pp. 563–564. [5 refs.]

In this paper, written shortly before his death, the author describes chemotherapeutic experiments on hamsters infected with *Leishmania donovani*. It was possible to control the action of any drug by performing a weekly liver puncture on the animals. The drugs were given hypodermically. It was found that tartar emetic produced severe necrosis. Antimosan gave a tolerated dose of 1·0 gm. and a minimal curative dose of 0·2 gm. per kilo of body weight. The chemotherapeutic index was 1 to 5. Stibosan gave corresponding figures of 0·7 and 0·15 with an index of 1 to 5 up to 1 to 7. With neostibosan with a tolerated dose of 1·0 gm. the minimal curative dose was 0·02 gm. and the index 1 to 50. The result with neostibosan is in agreement with that of NAPIER and MULLICK (above) in Calcutta in human kala azar. The author points out that the trial of antimony preparations in trypanosome infections in animals has not given any definite clues as to their value for kala azar.

C. M. W.

Boyd (T. C.) & Roy (A. C.). **A Preliminary Note on a Colour Reaction for "693" and its Application in the Estimation of that Compound in the Urine.**—*Indian Med. Gaz.* 1929. July. Vol. 64. No. 7. p. 382.

The authors have been attempting to devise a simple colorimetric method for estimating the amount of antimony in the urine of kala azar patients treated with "Bayer 693" (diethyl amine p-amino phenyl stibinate). After many trials the following procedure was found to give the best effect.

A standard solution is prepared by dissolving the drug in normal urine (usually a 1 in 10,000 solution). The standard solution and the urine to be tested are both treated as follows. To 0·5 cc. or more one drop of dilute hydrochloric acid is added and then 1·5 cc. of water and the mixture cooled on ice. After about ten minutes one drop of a 1 per cent. solution of sodium nitrite is added mixed and the test tubes again cooled on ice for about a minute. Then 1 cc. of about 1 per cent. solution of β-naphthol in 20 per cent. caustic soda is added and mixed. The red colour formed is allowed to develop for about five minutes. The colour of the patient's urine is compared with that of the standard solution in a test-tube colorimeter.

C. M. W.

Young (Charles W.), Hertig (Marshall) & Liu (Pao-Yung). **The Kala Azar Transmission Problem: Field and Laboratory Studies in China. II. Susceptibility of Various Rodents to Infection with** *Leishmania donovani*.—*Amer. Jl. Hyg.* 1929. July. Vol. 10. No. 1. pp. 183–200. [9 refs.] [Harvard Med. School, Boston, & Peking Union Med. College, Peking, China.]

The authors, the first of whom, regrettably, died before publication of this paper, give a detailed account of inoculation experiments on animals with strains of *Leishmania donovani* from cases of Chinese kala azar. The material used for inoculation was the ground-up liver and spleen of a heavily infected striped hamster, diluted with Locke's solution to give 10 cc. of emulsion. As a rule each animal was given 0·5 cc. of this standard emulsion by intraperitoneal inoculation. In most series inoculated a certain number of animals die as a result of the inoculation. The death rate from this cause is higher amongst animals which are difficult to keep alive in captivity. In judging the results these have to be excluded. Of 105 giant hamsters (*Cricetulus triton*) inoculated 97 lived over 10 days, and of these 79 became infected. The number of negatives—18—is unduly high, since 13 of them were in one batch of 39. There is a slight tendency to natural recovery from the infection. Of voles (*Microtus* sp.) 11 were inoculated and eight were found to be infected. Seven of these anmials received 1·0 instead of 0·5 cc. of the standard dose. Ten house rats (*Mus rattus*) were inoculated and all became infected. Of 134 house mice (*Mus wagneri*) 96 were positive. The dose was 0·25 cc. Of the 38 negatives 32 died within 20 days of the inoculation. Of 20 white rats (*Mus norvegicus albinus*) one series of 10 inoculated with from 1·4 to 2·7 cc. gave seven infections, but few parasites were present. The second series of 10 were inoculated with 1·0 cc. Three of the animals died immediately, but the seven remaining became moderately or heavily infected. The difference between the two series indicates that the white rat gives uncertain results. Of 44 white mice (*Mus musculus albinus*) receiving 0·5 cc. 37 became slightly

or moderately infected. Of 1,661 striped hamsters (*Cricetulus griseus*) 1,487 were positive. If 95 negatives which died within the first 20 days after inoculation are excluded, the infection rate is about 95 per cent. HINDLE, basing his conclusion on single lots of 12 hamsters for each of five strains of *Leishmania donovani*, stated that they differed in virulence. After an experience with much larger numbers of animals the authors find no variation in virulence between different strains. In the striped hamster the proportion of heavy infections is much greater than with any other animal. There is a tendency to recovery as shown by the fact that out of 887 which were positive by liver puncture during life 20 were negative at autopsy. During the period from 41 to 70 days after inoculation there were only two negatives out of 207 autopsies.

As it was realized that in attempts to transmit kala azar by the bites of insects only small doses of the virus were administered, it was determined to test the result of inoculating minimal numbers of parasites. To this end a series of experiments was carried out with the standard solution diluted from 1 : 10 up to 1 : 10^{14}. Though the hamsters inoculated with the highest dilutions received very few organisms infections occurred, for four out of ten were positive. The time required for infection to develop was greatly increased by the minimal doses, but it was shown that after 150 days the infections were comparable with those resulting from heavy doses. It was shown by the authors that striped hamsters become infected after intraperitoneal injection of cultures. Of 5 animals thus inoculated all became infected. In a series of scarification experiments with parasites from the organs of infected animals 18 out of 63 became infected, while with similar experiments made with cultures 7 out of 37 animals were positive. In these scarification experiments the course of the infections resembled those produced by the intraperitoneal inoculation of minimal doses. As regards feeding experiments, the ingestion of countless numbers of parasites by striped hamsters has not resulted in infection.

C. M. W.

SHORTT (H. E.), CRAIGHEAD (A. C.), SMITH (R. O. A.) & SWAMINATH (C. S.). **The Infection of Hamsters with Kala-Azar by the Oral Route.**—*Indian Jl. Med. Res.* 1929. July. Vol. 17. No. 1. pp. 335–338. [1 ref.]

In a previous paper (this *Bulletin*, Vol. 26, p. 323) the authors showed that hamsters could be infected with *Leishmania donovani* by the oral and conjunctival routes. In the paper under review an account is given of further experiments in which hamsters were infected by the oral route with parasites from the spleen and liver of other hamsters or with cultural forms. Of 10 animals given one dose of parasites from the liver and spleen eight became infected, and of six given orally from 57 to 88 doses of culture three became infected. These results prove that the assumption that the parasites, whether in the leishmania or leptomonas form, could not survive in the intestine because of the presence of bacteria is incorrect in spite of the fact that it is known that they will not survive with bacteria in the culture tube or in the sand-fly. The hypothesis of oral infection in kala azar is thus reopened and the obvious line of future work will be to determine the avenue by which viable forms of *L. donovani* may leave the mammalian host. The authors say that it is with reluctance that they re-open this question in the face of the strong circumstantial evidence tending to incriminate

Phlebotomus argentipes, but they do not mention the possibility of oral contamination with the flagellates in the sandflies which have ingested the mammalian forms of the parasite.

C. M. W.

MAJUMDAR (Akhil Ranjan). **A Simple Blood-Test for the Diagnosis of Kala-Azar (Preliminary Report).**—*Calcutta Med. Jl.* 1928. June. Vol. 22. No. 12. pp. 643–648.

The author describes a simple method for carrying out the aldehyde test for kala azar. In a small tube like a Dreyer's tube is placed ½ cc. of a 4 per cent. solution of urea stibamine. With a pipette less than a drop of blood is taken from the finger and thoroughly mixed with the solution in the tube. The mixture should have merely a faint red colour. The tube left standing in the vertical position shows in an hour in positive cases a flocculent precipitate which falls to the bottom of the tube.

C. M. W.

GEORGIEWSKY (A.). Die Komplementbildung [sic] bei innerlicher Leischmaniose des Menschen und Hundes. [**Complement Fixation in Visceral Leishmaniasis of Man and Dog.**]—*Pensée Méd. d'Usbékistane.* Tashkent. 1927. Dec. No. 3. pp. 80–84. [8 refs.] [In Russian. German summary p. 137.]

As antigen the author employed alcoholic extracts of the dried liver from cases of human and canine kala azar. Sera were taken from cases of human and canine kala azar and as controls from cases of malaria and syphilis and healthy dogs. It was found that the antigen in presence of the leishmania serum could to a certain extent cause fixation of the complement, but this was also the case when malarial and syphilitic sera were substituted. The antigen was therefore not specific for a leishmania infection. On the other hand, with syphilitic antigen the leishmania sera did not bring about fixation of the complement.

C. M. W.

DE CAPUA (F.). Alterazioni del sistema reticoloistiocitario nella leishmaniosi infantile. I. Le cellule endoteliali nel sangue periferico dei bambini leishmaniotici. [**Changes in the Reticulo-Endothelial System in Infantile Leishmaniasis.**]—*Pediatria.* 1929. Aug. 15. Vol. 37. No. 16. pp. 869–880. With 4 figs. on 2 plates & 19 figs. on 1 coloured plate. [21 refs.] [Inst. Clin. Pediatrics, Univ., Naples.]

In a case of infantile kala azar it was noted that large numbers of endothelial cells were present in the blood. At one stage they represented 26 per cent. of the white cells. Under treatment with tartar emetic and consequent improvement the endothelial cells in the blood diminished in number. Though 10 per cent. of these cells contained red blood corpuscles, not one was found containing leishmania. An examination of spleen pulp and bone marrow showed that there was a hyperplasia of the reticulo-endothelial system which

resulted in a great outpouring of endothelial cells into the circulation. Leishmaniasis can thus be regarded as a definite parasitic blocking of the reticulo-endothelial system.

C. M. W.

Messik (R. E.). Zur Frage der genetischen Beziehungen zwischen *Leishmania tropica* und *Leishmania donovani.* [**Genetic Relations between** *L. tropica* **and** *L. donovani.*]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1929. Vol. 63. No. 3/4. pp. 327–336. [14 refs.] [Microbiol. Research Inst., Education Commissariat R.S.F.S.R. Moscow.]

The author has investigated the adhesion phenomenon in mice immunized with two strains of *Leishmania tropica* and two of *L. donovani.* The four strains showed similar antigenic properties, and the titre of the thrombocytobarine produced by one strain was the same for it as for the other strains. Similarly, the change in growth produced by the addition to culture medium of immune serum of various dilutions showed a parallel with the thrombocytobarine production and was similarly not specific for any strain. The results indicate that all strains of leishmania have similar antigenic properties.

C. M. W.

da Fonseca (Flavio). Possibilidade de infecção do camondongo branco com a *Leishmania brasiliensis* Vianna, 1911. [**Infection of White Mouse with** *L. brasiliensis.*]—*Bol. Biol.* S. Paulo. 1929. June 30. No. 15. pp. 18–19. [Microbiol. Lab., Faculty of Med., S. Paulo.]

Of 46 white mice inoculated with *Leishmania brasiliensis* only one became infected. This was an animal which was inoculated into the vagino-peritoneal recess with an eleven-day-old first subculture of the parasite. Death took place on the 70th day and leishmania were found in smears from the liver.

C. M. W.

Mu (Jui-wu) & Huie (Dorothy). **Specificity of the Kahn Reaction in Kala-Azar.**—*Nat. Med. Jl. China.* 1929. Aug. Vol. 15. No. 4. pp. 436–439. [15 refs.] [Peking Union Med. College, Peping, China.]

Forty-one sera from 37 cases of kala azar in N. China were examined by the Kahn test in parallel with Kolmer's Wassermann reaction. The cases varied in duration from one month to four years. Of the 37 cases only 3 gave a positive Kahn test and in these the Wassermann test gave a similar result. In 2 of the 3 cases there was evidence of syphilis, while in the third the test was negative when repeated. It thus appears that the specificity of the Kahn test was not affected by the high globulin content of the serum which is characteristic of kala azar. High fever, when it occurred, likewise did not alter the reaction.

C. M. W.

Chopra (R. N.) & Choudhury (S. G.). **Studies in Physical Properties of Different Blood Sera. Part III. Viscosity.**—*Indian Jl. Med. Res.* 1929. Apr. Vol. 16. No. 4. pp. 939–945. [18 refs.] [Calcutta School of Trop. Med. & Hyg., Calcutta.]

Since in higher animals the blood circulates through a complex network of tubes, it is obvious that the viscosity of blood and serum must be a matter of some importance. Though much work has been done on the viscosity of normal blood, little attention has been paid to pathological conditions. The authors have investigated by the ordinary flow methods sera from cases of kala azar, syphilis, tuberculosis and leprosy. The highest values were obtained for kala azar sera and those from advanced cases of tuberculosis, but an increase above normal is also shown by syphilitic sera. Those of cases of leprosy gave divergent values. The increase is attributed to a relative increase in the globulin content, exceptionally high values being due to a relative increase in euglobulin. It has further been noted that a serum showing higher viscosity exhibits diminished buffer action and lower surface tension.

C. M. W.

Chodoukine (N. I.). Essais d'infection des phlébotomes par *Leischmania canis* (Nicolle). [**Experiments of Infection of Phlebotomus with** *L. canis.*]—*Pensée Méd. d' Usbékistane.* Tashkent. 1927. Dec. No. 3. pp. 53–68. With 2 plates. [47 refs.] [In Russian. French summary p. 135.]

Working in Tashkent with *Phlebotomus perniciosus, P. sergenti* and *P. papatasii* the author has produced infection in 2·8 per cent. of 398 flies by feeding them on the ears of a dog suffering from generalized leishmaniasis. The flies used were wild ones, but natural infection was excluded by the examination of 164 as controls with negative results. Furthermore, during the past two years over 500 wild flies from Tashkent and Bokhara have been dissected without a single naturally infected fly being discovered. The flagellates were first found on the fourth day, the flies having been kept at a temperature of 13° C. to 28° C. in a humid atmosphere. The flagellates were found in the pharynx, oesophagus and upper part of the intestine up to the 11th day, after which signs of degeneration appeared.

C. M. W.

Lo Presti-Seminerio (F.). Considerazioni su ventuno casi di leishmaniosi infantile. [**Twenty-One Cases of Infantile Leishmaniasis.**]—*Pediatria.* 1929. Aug. 1. Vol. 37. No. 15. pp. 813–827. [21 refs.]

The paper describes the clinical features of 21 cases of infantile kala azar studied by the author in Agrigento, a town on the south coast of Sicily.

C. M. W.

Fanano (Vincenzo). Su di un caso di leishmaniosi interna infantile. [**Case of Infantile Leishmaniasis.**]—*Policlinico.* Sez. Prat. 1929. July 29. Vol. 36. No. 30. pp. 1069–1072. [14 refs] ["Bambin Gesù" Children's Hosp., Rome.]

The paper records a case of kala azar in a child of three in Rome. Infection took place in San Remo. Treatment with tartar emetic was successful.

C. M. W.

Pangalos (Georges Const.). Un cas de leishmaniose infantile avec gangrène de la machoire inférieure. [**Case of Infantile Leishmaniasis with Gangrene of Lower Jaw.**]—*Grèce Méd.* 1929. May–June. Vol. 31. No. 5–6. p. 17. With 1 text fig. [3 refs.]

A case of kala azar in a child six years of age. The disease appears to have been contracted in Salamis, from which cases have not hitherto been recorded.

C. M. W.

Schéwtschénko (Ph. I.). Sur le mode de conservation de cultures des corpuscules de Leishman. [**Means of Preservation of Cultures of Leishmania.**]—*Pensée Méd. d' Usbékistane.* Tashkent. 1927. Dec. No. 3. pp. 74–79. [In Russian. French summary pp. 136–137.]

A comparison of various media which have been employed for the cultivation of leishmania, with suggestions for their improvement.

C. M. W.

Canaan (T.). **The Oriental Boil: an Epidemiological Study in Palestine.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1929. June 25. Vol. 23. No. 1. pp. 89–94. [2 refs.]

Since the war cases of oriental sore have occurred in Palestine in places other than Jericho, which was previously regarded as the only endemic focus in this country. In some instances association with individuals who had contracted the disease in Jericho was proved to have occurred, and the author concludes that since the war there has been an actual introduction of oriental sore into localities previously free. He does not think that any cause other than the sandfly is responsible for the infection, and explains the fact that in Aleppo oriental sore is much more common than in Jericho by the greater incidence of infected sandflies in the former. The fact that in 78·5 per cent. of the cases the eruption first appeared in the summer months while in the remaining 21·5 per cent. it appeared in the autumn or early winter is explained by the theory of sandfly transmission, for in Jericho these flies do not occur or are very rarely seen between the end of December and the beginning of April. People who visit Jericho in the day time only do not as a rule become infected. In three cases there had been a stay of only a few days, and in these the incubation periods were four, five and six weeks. The author mentions his experience in Aleppo, where he found that 187 of 191 children belonging to 38 families had been infected in infancy. Of 50 Europeans who had spent at least two successive years in Aleppo only seven had been attacked. In Aleppo it would seem that children with more delicate skins than adults are more susceptible. In Jericho, however, many adults become infected. In Aleppo an infection with few lesions is the rule, the number only exceptionally exceeding six to ten. In Jericho the author has seen 55 in one patient, while in another the thin hairy scalp was full of papules, while the face and extremities were also covered with small and large eruptions. The author believes that every main eruption is due to a separate sandfly bite. Around the main lesion, however, may occur one or more small papules which probably indicate an extension by way of the lymphatics.

C. M. W.

Buss (G.). Die amerikanische Hautleishmaniose. [**American Dermal Leishmaniasis.**]—*Arch. f. Dermat. u. Syph.* 1929. Aug. 10. Vol. 158. No. 1. pp. 202–222. With 10 text figs. [22 refs.]; pp. 223–265. With 10 text figs. [1 page of refs.]

The paper gives the results of a histological study of 62 cases of South American cutaneous leishmaniasis and is based on 94 pieces of tissue removed from the patients. In only 51 of these pieces was it possible in section to demonstrate leishmania, though all the cases were clinically characteristic of the disease. In only three cases were the parasites found to be numerous. It thus appears evident that in the S. American disease the parasites are present in much smaller numbers than is the case with oriental sore. The suggestion is made that parasitic foci originate from the blood vessels, which are of importance from the point of view of the character and course of the disease and may account for invasion of the mucosae. As a rule the formation of tuberculoid tissue is seldom seen and is a less important feature than it is in oriental sore. In late stages of the disease tissue resembling tubercles may occur, while in about one-third of the cases giant cells were found.

C. M. W.

Chacón (Arnoldo Lachner). **Cutaneous Leishmaniasis.**—*Seventeenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1928. pp. 183–185. [United Fruit Co. Hosp., Limon, Costa Rica.]

It is pointed out that the frequent incidence of cutaneous leishmaniasis in Central America has not been reported until recently. In the hospital from which the author writes 20 cases have been seen during the year and he states that microscopic examination reveals the fact that 40 to 50 per cent. of all ulcers seen are cases of leishmaniasis. The recognition of the cause is important, for ulcers due to spirilla respond to arsenical treatment, whereas those due to leishmania react to antimony. The clinical aspect of the ulcers is that of the phagedenic type, and they are more commonly observed on the legs than elsewhere, especially in the middle and lower thirds. Ulcers of the face and the toes are, however, not uncommon. Treatment consists of local applications to rid the ulcers of bacterial infections and internal administration of antimony. The intravenous injection of tartar emetic in doses of 0·08 gm. to 0·1 gm. has given excellent results.

C. M. W.

Reynolds (D.). **A Mild Form of Tropical Sore.**—*Jl. Roy. Army Med. Corps.* 1929. Oct. Vol. 53. No. 4. p. 288.

During the autumn and winter of each year there is seen in Ismailia, Moascar and Abu Sueir a type of indolent sore which resembles mild cutaneous leishmaniasis. Though no leishmania have been found on microscopical examination, the best treatment for the condition is the applications of a 2 per cent. tartar emetic ointment in the morning and evening for two days, followed by a hot boric fomentation for 12 hours, after which a simple dressing with lotio rubra is employed till a healthy scab is formed.

C. M. W.

NUTTER (R. B.). **Oriental Sore.**—*Seventeenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1928. pp. 191–192. With 1 text fig. [Tela Railroad Co. Hosp., Tela, Honduras.]

Cases of cutaneous leishmaniasis are not infrequently seen, but the case recorded with two ulcers on the left hand is the first noted with multiple lesions. Intravenous injections of 1 per cent. solution of tartar emetic every third day, beginning with 1 cc. and increasing to 4 cc., have given satisfactory results. The advantages of preparing a fresh solution for each injection or the disadvantages of sterilizing the solution by boiling have not been apparent.

C. M. W.

VIGNE, ASSADA & AUDIER. Double bouton d'Orient de la face. [**Double Oriental Sore of the Face.**]—*Marseille-Méd.* 1929. Sept. 25. Vol. 66. No. 27. pp. 380–381.

Note of a case of oriental sore in an Arab from Algeria who noted the first signs of the disease a month after arrival in Marseilles. There were two sores on the face which had improved considerably in a fortnight after administration of treparsol in dose of 1 gm. daily with a rest of three days after each fourth injection.

C. M. W.

DOSTROWSKY (Arje). Zur Behandlung der Leishmaniosis cutanea. [**Treatment of Dermal Leishmaniasis.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1929. Aug. Vol. 33. No. 8. pp. 417–423. [4 refs.] [Rothschild Hosp., Hadassah Med. Organization, Jerusalem.]

Having dealt with over 200 cases of oriental sore in Palestine, the author discusses the treatment, basing his remarks on 70 cases which he had followed carefully. The disease has a distinct tendency to be self-healing and popular opinion is not in favour of any active interference. In Jericho it is believed that the duration is months and in other localities one year. The treatment adopted by the natives is the application of the leaf of some plant. This has the effect of producing a moist chamber in which healing occurs. A similar state of affairs exists when an ointment is applied. Though in many cases a sore will heal in the usual time, not a few cases last longer and many show progressive ulceration. One case quoted had a history of 2½ years. Mention is made of the experimental inoculations made by ADLER and THEODOR. In these cases the resulting sores healed spontaneously in from 3 to 17 months. Thus in no case is it possible to predict what will be its duration. In the treatment of a disease in which spontaneous cure followed by immunity occurs, the assistance of the natural processes should be aimed at. On this account an active immunization would be the ideal treatment. Ten cases were treated with a vaccine, and in two of these the nodules and ulcers, which were of 2 to 3 months' duration, as also the enlarged lymphatic glands, disappeared after the fourth injection. In the others the course of treatment was not completed. The commencing dose contained half a million parasites. In some cases painful sterile abscesses developed at the site of the inoculations. In spite of the defects, it would seem that the rapid action in the two cases is an indication that the method, if improved, will be of value.

Nine cases were treated with salvarsan and healing occurred in 45 to 90 days. One case, a girl with 158 nodules, showed no improvement after 6 injections of neosalvarsan. A cure was effected after

10 injections of tartar emetic. Another patient, from Bokhara had a sore on the dorsum of the right hand with a history of 2½ years. There was resistance to salvarsan and Röntgen rays , but cure following tartar emetic. With antimony therapy the greatest number were treated. No case resisted tartar emetic, healing occurring on the average in 90 days. Intramuscular injection of antimosan in two cases was not satisfactory. Tartar emetic undoubtedly gives good results with little disfigurement. Occasionally, when a 2 per cent. solution was used, in spite of correct administration, there was pain along the course of the vein. Of 30 cases treated with Röntgen rays only 1 was refractory. The treatment lasted from 30 to 120 days. The dose at present employed is 1 HED (Holsnecht erythema dose) in 2 applications with a week's interval. It has been noted that repeated small doses cause the sore and surrounding tissues to swell and become hyperaemic, while with a higher dose the sore disappears without any swelling. The resulting scarring appears to be more disfiguring than after the methods of treatment mentioned above. In Röntgen ray treatment it is necessary to discover the smallest dose which will bring about rapid healing without damage to the healthy tissues. With carbonic acid freezing 10 cases were cured in 60 to 90 days. There were 6 or 7 applications of 10 to 15 seconds. Not all patients, however, will submit to this painful treatment.

In order to compare accurately one form of treatment with another it would be necessary to treat in one patient similar sores of like duration. As this is not possible, care must be taken that the comparisons are made between cases in which the stage of the disease and the types of sore are the same. In a small series of cases in which the sores were of the non-ulcerating type the following results were obtained. With Röntgen rays 3 cases were cured in 1½ to 2 months, 3 months and ½ month respectively ; with antimosan 1 case was cured in 1½ month and two failed in 2 months and 1 month ; with tartar emetic 2 cases were cured in 4 and 3 months ; with salvarsan 2 cases were cured in 3 months and 1 case had not responded in 2 months. Though the cases are few in number, it is clear that the duration of the disease had been very much shortened. The best method is that of Röntgen rays. It is rapid, there is the least waste of time for the patient and it is painless. On the other hand, it is expensive and is not always available. Where Röntgen rays cannot be employed the best treatment is by CO_2-snow or antimony. The author believes, however, that with improved technique vaccine therapy will give good results.

C. M. W.

Vigne (Paul) & Fournier (A.). Le traitement du bouton d'Orient. A propos de quelques cas personnels. [**Treatment of Oriental Sore.**]—*Rev. Prat. Malad. des Pays Chauds.* 1928. Aug. Year 7. Vol. 8. No. 8. pp. 412–419. [31 refs.]

The authors have had the opportunity of studying numbers of cases of oriental sore in Armenians on their arrival in Marseilles. After trying many of the treatments which have been recommended and which are mentioned in the paper, it was found that intramuscular injections of 3 cc. of iodobismuthate of quinine gave the best results. After 15 to 20 injections a cure is usually obtained. This treatment is now adopted for all cases. Escomel has reported good results after the use of this drug in South America. When the sore is small and in

an area with loose skin it may be safely removed surgically. Other sores may be cleaned up with moist antiseptic dressings and treated by radiotherapy, or if this is not available with permanganate of potash powder following curetting.

C. M. W.

VATCHAGHANDY (Sorab Bappji). **A Persian Treatment for Oriental Sore.**—*Indian Med. Gaz.* 1929, Oct. Vol. 64. No. 10. p. 572.

The treatment which was used by the author with success in one case consists in the daily application of an ointment consisting of one part of red oxide of antimony and four of " aishnoo " with yolk of egg. The " aishnoo " is a powdered Persian plant which is employed by the natives as a substitute for soap. In an editorial note it is suggested that the substance is of the nature of soap-nut, which contains large quantities of irritating saponins.

C. M. W.

PARROT (L.). Notes sur la leishmaniose expérimentale (*Leishmania tropica*) de la souris blanche. [**Experimental Leishmaniasis** (*L. tropica*) **of the White Mouse.**]—*Arch. Inst. Pasteur d'Algérie.* 1928. Dec. Vol. 6. No. 4. pp. 453–464. With 1 plate. [4 refs.] [Pasteur Inst. of Algeria, Algiers.]

Seven culture strains of *Leishmania tropica* of Algerian origin have all proved to be infective for mice when inoculated intraperitoneally, intratesticularly or subcutaneously or cutaneously in the tail. After the first two methods of inoculation there is a rapidly developed generalized infection followed by secondary cutaneous lesions, ulceration around the ears and tail, scrotal ulceration, adenitis, arthritis and periarthritis. When injected into the tail the cultures produce lesions resembling oriental sore in man. After long maintenance in subculture three strains definitely depreciated in virulence for mice. The infectivity for mice was not correlated with the presence of the round forms (O-bodies of Row). The results indicate that the flagellate forms alone are infective. Attempts were made to vaccinate mice against infection by the use of strains which had lost their virulence. Of 12 mice which received repeated injections of non-virulent cultures 10 were subsequently infected with a virulent strain. The two which did not become infected behaved as if they were immune. With cultures killed with formalin no protection was given. Of 15 mice inoculated repeatedly with cultures of the non-virulent leptomonas of the gecko 12 were found to be not immune when inoculated with *L. tropica*. One of the three which resisted infection on two occasions was infected a year later. The general conclusion is that immunity was not conferred by the vaccination procedures employed.

C. M. W.

MAZZA (Salvador) & NIÑO (Flavio). Notas hematológicas y serológicas sobre leishmaniosis tegumentaria americana. [**Haematological and Serological Notes on American Dermal Leishmaniasis.**]—*Prensa Méd. Argentina.* 1929. June 10. 15 pp. [11 refs.] [Inst. of Clin. Surg., Univ., Buenos Aires.]

In the northern province of Brazil, where cutaneous leishmaniasis is of frequent occurrence, the authors examined 4 or 5 films of the

peripheral blood of 392 cases in all stages of the disease. In no case were leishmania seen. From 35 of these cases cultures were made from the peripheral blood, but these likewise gave negative results. In the majority of the cases parasites were found in material taken from the lesions. In 65 cases the leucocytes of the blood were investigated. There was a definite increase in the mononuclear cells. In the peripheral blood there was an average mononuclear count of 41 per cent. and of these 36 per cent. were lymphocytes. In blood taken from the region of the sore the figures were 48 and 45. In the peripheral blood there were on an average 6 per cent. of eosinophiles. As regards the Wassermann reaction, it was negative except on rare occasions. The formol-gel test and the serum-water test, which give positive results in kala azar, were negative.

C. M. W.

Mesik (P. E.). Sugli anticorpi in riguardo alle Leishmanie. [**Antibodies in respect to Leishmania.**]—*Giorn. di Batteriol. e Immunol.* Turin. 1928. Apr. Vol. 3. No. 4. pp. 225–244. [12 refs.] [Bact. Inst., II. State Univ., Moscow.]

During the process of immunization of rats with cultures of *Leishmania tropica* there appear in the blood, in addition to thrombocytobarines, antibodies capable of producing fixation of complement and lysins. The antibodies and lysins are strictly specific for the corresponding antigen and show no action with trypanosomes. There is a definite parallel between the production of thrombocytobarine and antigen and an antagonism between the former and lysins. During immunization neither agglutinins nor precipitins are found.

C. M. W.

Tkeschelaschwili (K.) & Tschilingaroff. [Leischmaniosis cutanea in Georgien.] [**Dermal Leishmaniasis in Georgia.**]—*Nachrichten der Tropischen Medizin.* Tiflis. 1929. Vol. 2. No. 5. pp. 327–331. With 1 text fig. [9 refs.] [In Georgian script. German summary p. 409.]

The discovery of three cases of oriental sore in natives of the Gori district and two in natives of Tiflis proves that the disease is endemic in Georgia. Hitherto it has been supposed that all cases were introduced from elsewhere.

C. M. W.

de Buen (S.). Dos nuevos casos de boton de Oriente en Andalucia. [**Cases of Oriental Sore in Andalusia.**]—*Medicina Países Cálidos.* Madrid. 1929. Sept. Vol. 2. No. 5. p. 450.

A record of two cases of oriental sore in children in Spain.

The first was from the district of Motril in the province of Granada, from which cases have already been reported, while the second was from the neighbourhood of Arcos. Both cases were diagnosed by the discovery of leishmania, while the second is the first to be reported from the province of Cadiz.

C. M. W.

Céard (L.). Sur un nouveau foyer de bouton d'Orient constaté dans le Sahara oranais. [**New Focus of Oriental Sore in the Sahara.**]—*Arch. Inst. Pasteur d'Algérie.* 1928. Dec. Vol. 6. No. 4. pp. 465–467. [3 refs.] [Pasteur Inst. of Algeria, Algiers.]

The discovery of two cases of oriental sore at Ksar Abadla, has extended to latitude 31° N. the endemic area of this disease in the Sahara.

C. M. W.

Joyeux (Ch.). Travaux récents sur les leishmanioses cutanées. [**Recent Work on Dermal Leishmaniasis.**]—*Rev. Prat. Malad. des Pays Chauds.* 1928. Dec. Year 7. Vol. 8. No. 12. pp. 608–619.

A general review which gives no new information.

C. M. W.

RELAPSING FEVER.

i. Delanoë (P.). Contribution à l'étude du spirochète marocain, *Sp. hispanicum* var. *marocanum* Ch. Nicolle et Ch. Anderson, 1928. [**Study of the Moroccan Spirochaete** *S. hispanicum* **var.** *marocanum*.]—*Arch. Inst. Pasteur de Tunis.* 1929. June. Vol. 18. No. 2. pp. 133–162. With 1 map, 2 charts & 2 figs. on 1 plate. [3 refs.] [District Hosp., Mazagan.]

ii. Nicolle (Charles), Anderson (Charles) & Hornus (Pierre). Etude d'un spirochète du groupe *Sp. hispanicum* S. de Buen, isolé d'un cas de fièvre récurrente marocaine. [**Study of a Spirochaete belonging to the Group** *S. hispanicum* **S. de Buen, isolated from a Case of Moroccan Relapsing Fever.**]—*Ibid.* pp. 163–187. With 1 chart in text. [6 refs.]

iii. —— & ——. Note au sujet des deux précédents mémoires. [**Note on the Two Preceding Memoirs.**]—*Ibid.* pp. 188–198. [2 refs.]

i. The author has collected *Ornithodorus* (*O. marocanus*) in Morocco from pigsties, the burrows of porcupines and fox holes. The ticks from the latter sites were more often infected with spirochaetes than those from pigsties. All the inoculation tests are given in detail.

ii. The second paper comprises a detailed account of an experimental study of a strain of Moroccan relapsing fever isolated from a man, who acquired the infection as the result of being bitten by Ornithodorus.

iii. The last paper is a discussion of the problem of relapsing fever in Morocco in which the authors reaffirm their view that the small rodents constitute the main reservoir of the infection, and bring forward lengthy arguments in support of this theory.

E. Hindle.

Delanoë (P.). Les spirochètes marocains des Ornithodores des terriers et le spirochète de Mansouria ne sont pas doués de récurrence pour l'homme. Ils constituent une espèce distincte du spirochète espagnol, *Sp. hispanicum* S. de Buen 1926. [**Moroccan Spirochaetes of** *Ornithodorus* **from Burrows and the Spirochaete of Mansouria do not cause Relapses in Man. They constitute a Distinct Species from the Spanish Spirochaete,** *Sp. hispanicum* **S. de Buen 1926.**]—*C.R. Acad. Sci.* 1929. Sept. 2. Vol. 189. No. 10. pp. 398–400. [2 refs.]

The author isolated a strain of spirochaetes from Ornithodorus collected from the burrows of porcupines in Morocco. This strain was pathogenic to guineapigs, and three men inoculated with guineapig blood containing numerous spirochaetes showed a slight rise in temperature on the 8th day which lasted for about 2 days. Spirochaetes were found in the blood in very scanty numbers during this period but no relapses occurred and the cases recovered without treatment. Similar results were obtained in two natives inoculated with a Mansouria strain of spirochaetes obtained from Nicolle. One of the cases that had recovered from infection with the Moroccan strain was found to be immune against the Mansouria strain and from

their general resemblance the author concludes that these two are identical. At least three strains of relapsing fever may occur in Morocco.

(1) *S. recurrentis*, causing the ordinary European relapsing fever.

(2) *S. hispanicum*, S. de Buen, or a related form, causing the Spanish type of relapsing fever.

(3) *S. marocanum* Nicolle and Anderson, *emend.* Delanoë, causing a mild non-relapsing type of fever.

E. H.

Nicolle (Charles), Anderson (Charles) & Colas-Belcour (Jacques). Sur les rapports du spirochète récurrent marocain *Sp. hispanicum* var. *marocanum* avec le porc-épic. [**On the Relation of Moroccan Relapsing Fever,** *S. hispanicum* **var.** *marocanum*, **with the Porcupine.**]—*C.R. Acad. Sci.* 1929. July 29. Vol. 189. No. 5. pp. 224–226. [2 refs.]

The authors previously advanced the view that the common small rodents act as reservoirs of this infection in Morocco. Delanoë [see above] suggested that the porcupine might be the reservoir, but as this animal is comparatively rare and lives in the mountains away from human habitations it does not seem such a likely host as the common small rodents. Three of these animals were inoculated with this strain of spirochaetes by Delanoë and found to be resistant, but these results were explained as possibly due to immunity acquired as the result of a previous infection. The authors have recently obtained a young porcupine which when inoculated with this strain showed a few spirochaetes in its blood on the 9th and 10th days and died the following day. Its blood was infective to other susceptible animals; consequently the porcupine may be of some significance as a natural reservoir of this disease, but its importance is only secondary to that of the more common rodents.

E. H.

i. Remlinger (P.) & Bailly (J.). Animaux réceptifs au spirille de la fièvre récurrente marocaine : (*Spirochaeta hispanicum* var. *marocanum*, souche Tetuan), et animaux réfractaires. [**Animals susceptible to Infection with the Spirochaete of Moroccan Relapsing Fever** (*S. hispanicum*, **var.** *marocanum*, **Source Tetuan**) **and Animals Refractory.**]—*C.R. Soc. Biol.* 1929. Nov. 15. Vol. 102. No. 30. pp. 508–509.

ii. —— & ——. Principaux modes d'inoculation du spirille de la fièvre récurrente marocaine : (*Spirochaeta hispanicum* var. *marocanum*, souche Tetuan). [**The Principal Methods of Inoculation of the Spirochaete of Moroccan Relapsing Fever** (*S. hispanicum*, **var.** *marocanum*, **Source Tetuan**).]—*Ibid.* pp. 505–507. [Pasteur Inst. of Morocco, Tangiers.]

i. The first paper in addition to confirming previous observations by Nicolle and Anderson [see this *Bulletin*, Vol. 25, p. 586], in particular the invariable susceptibility of the guineapig, contains records of attempts to infect other animals. The hedgehog, wild rats and wild mice were readily infected, also with difficulty rabbits, young dogs, and in one case a kitten of 3 months old. Adult cats were refractory. The jackal, fowl, pigeon, martin, tortoise, frog, and fishes were inoculated in various ways but were completely refractory.

ii. The second paper is a discussion of the various methods of inoculation and the results obtained by their use. Susceptible animals were infected by all the usual methods, including percutaneous inoculations; also by the introduction of infected blood into the stomach or rectum. In view of the fact that all conjunctival membranes allowed the passage of virus the authors recommend the placing of a drop of infected blood in the nose or on the conjunctiva in order to produce infection in paralytic patients receiving pyretic treatment by the aid of this organism.

E. H.

Remlinger (P.) & Bailly (J.). Siège du virus récurrent hispano-marocain (*Spirochaeta hispanicum* var. *marocanum*, souche Tetuan) chez les animaux artificiellement infectés. [**The Site of the Virus of Spanish-Moroccan Relapsing Fever** (*Spirochaeta hispanicum* **var.** *marocanum*, **Source Tetuan**) **in Experimentally Infected Animals.**]—*C.R. Soc. Biol.* 1929. Nov. 22. Vol. 102. No. 31. pp. 548–550. [Pasteur Inst. of Morocco, Tangiers.]

The authors found that the virus may be present in the urine of guineapigs infected with *S. hispanicum* var. *marocanum*. The urine of 2 out of 6 animals, at the height of the infection, when inoculated into normal guineapigs reproduced the disease. The marrow of the femur was also found to contain the infection. The aqueous humour contained the virus in a virulent form, either visible or non-visible, but the vitreous humour was always negative. The milk and bile also gave negative results. The brain of guineapigs was found to be infective at least 60 days after the disappearance of spirochaetes from the circulation. In refractory animals, such as pigeons, the intracerebral injection of spirochaetes resulted in their persistence in the brain for considerable periods up to 23 days in one instance. The spirochaetes were found to disappear from the circulation and organs very rapidly towards the end of the disease and sometimes they could not be detected in the films made from animals that had died overnight and were heavily positive the previous evening. Nevertheless, although these cadavers were negative to microscopic examination, the virus was found to persist in the liver and brain for 48 to 50 hours after death, as determined by inoculation into other animals. Defibrinated blood containing spirochaetes when kept in glass pipettes at the room temperature was found to keep its virulence for at least 12 days. The authors consider that their observations on this organism support Nicolle's view that there is an invisible pathogenic stage and that the visible spirochaete is merely a return to the ancestral saprophytic form.

E. H.

Nicolle (Charles) & Anderson (Charles). Les spirochètes récurrents marocains du groupe *hispanicum* ne sont pas séparables en espèces. [**Moroccan Relapsing Fever Spirochaetes of the** *hispanicum* **Group cannot be divided into Species.**]—*C.R. Acad. Sci.* 1929. Nov. 18. Vol. 189. No. 21. pp. 817–819.

The authors find that all the strains of Moroccan relapsing fever, including the one from Mansouria [see above p. 106], belong to the same species *S. hispanicum*, and are all transmitted by ticks.

E. H.

Nicolle (Charles) & Anderson (Charles). Indifférence des spirochètes récurrents pour leurs hôtes du genre Ornithodore. [**Relapsing Fever Spirochaetes in relation to Species of the Genus** *Ornithodorus*.] —*Acta Med. Scandinavica.* 1929. Vol. 70. No. 5/6. pp. 392–395.

The authors summarize their interesting observations on this question [see this *Bulletin*, Vol. 26, p. 658] showing that any species of Ornithodorus is capable of transmitting all strains of relapsing fever normally transmitted by ticks belonging to this genus. In order to succeed it is necessary to feed the ticks on the infected animal during the nymphal stage. The infection is usually transmitted hereditarily in the tick through several generations, but when the species of tick is not the carrier of the spirochaete in nature, the infection seems to die out sooner than when the tick is the natural carrier.

E. H.

Moskwin (I. A.). Ueber die Rolle der Zecke (Ixodoidea) *Ornithodorus papillipes* Bir. (Turkestan) in der Uebertragung des Rückfallfiebers. [**The Rôle of** *O. papillipes* **Bir. (Turkestan) in the Transmission of Relapsing Fever.**]—*Ztschr. f. Parasitenk.* 1929. June 17. Vol. 2. No. 1. pp. 73–89. With 8 text figs. [39 refs.]

A description of transmission experiments with *Ornithodorus papillipes* and a strain of Russian relapsing fever. The ticks were obtained from Turkestan and were proved to be uninfected on arrival. These ticks were fed through a membrane on defibrinated blood containing numerous spirochaetes. A modification of Hindle and Merriman's method was adopted [see this *Bulletin*, Vol. 23, p. 293] using a piece of a bat's wing as the membrane. Infected ticks when fed on guineapigs and rabbits produced infection with spirochaetosis. The injection of coxal fluid from these ticks into susceptible animals never produced infection, and the author is of the opinion that the salivary secretion is responsible for the introduction of the infection. The inoculation respectively of salivary glands, alimentary canal, Malpighian tubules and ovaries of infected ticks in all cases produced infection in guineapigs. The inoculation of the salivary glands of infected ticks produced infection in guineapigs after a shorter incubation period than when any other infected organ was inoculated, which supports the view that this is the most favourable site for the infective stage of the spirochaete in the tick. The author traced all stages in the tick from the spirochaete in the alimentary canal to granular and cyst-like forms in the Malpighian tubules, salivary glands and ovaries, but efforts to trace any development in pure cultures gave negative results. It is noted, however, that 12 days after ticks had fed on blood containing spirochaetes, no trace of these organisms could be found either in the gut or any of the other organs. Yet the bites of these ticks produced infection respectively 30, 150 and 170 days after the original infected meal. The ease with which infection could be transmitted by this species of tick supports the view that in nature, it is responsible for the spread of relapsing fever in Bokhara.

E. H.

KNOWLES (R.), GUPTA (B. M. Das) & BASU (B. C.). **Preliminary Observations on the Morphology and Life-History of** *Spirochaeta anserina.*—*Far Eastern Assoc. Trop. Med. Trans. Seventh Congress, British India, 1927.* Vol. 2. pp. 573–581. [12 refs.]

The authors have studied the life-history of *Spirochaeta anserina*, the common fowl spirochaete, in both the vertebrate and invertebrate hosts. Although *Argas persicus* is very common in Calcutta, neither infected fowls nor ticks were ever obtained there and the strain used was obtained from the Institute for Veterinary Research at Muktesar. 126 fowls were infected and when 0·5 cc. of infected blood was injected into the wing vein the birds almost invariably showed spirochaetes in the circulation within 24 hours. The birds then had a single attack of fever generally of 2–7 days, and in fatal cases death occurred in 1–27 days after inoculation, the mean being 6·45 days. Spirochaetes were present in the circulation for an average of 2·5 days and before disappearing gathered in tangles and broke up into granules, which, however, are considered to be entirely the result of degeneration. Some birds showed an after-phase, resembling that described by Dr. Andrew BALFOUR in Sudanese fowls. The disease is considered to bear no direct relation to spirochaetosis, but to be the result of overcrowding or keeping the birds under unhealthy conditions. The bodies found in the red cells are explained as the result of karyorrhexis of the nuclei, poisoned by toxins. No intracellular stage of the spirochaete was found in any of the internal organs of infected fowls.

With regard to the life cycle in the invertebrate host, *Argas persicus*, 51 out of 58 became infected when fed on birds at the height of the disease. These were dissected at various intervals and emulsions of the organs examined under the dark ground. Spirochaetes were observed in the internal organs of these 51 ticks as follows: Intestine or diverticula in 40; salivary glands in 25; coxal gland in 7 out of 35 females; Malpighian tubules in 4; coelomic fluid in 21; testis in 2 out of 16 males; white gland in 6 out of 16 males; ovary in 3 and uterus in 2 out of 35 females; brain in 12.

The authors believe the life-cycle to be as follows: In the tick 85 to 90 per cent. of the ingested spirochaetes die off and the remaining 10 to 15 per cent. assume two types. The majority are normal and actively motile spirochaetes, dividing by binary fission but in addition long jointed forms are present which break up into 3, 4 or 5 short forms. By incessant division of the motile forms the gut gradually contains numerous very fine short spirochaetes—about one-third the length of the blood form and extremely thin. These "*tenue*" forms invade the coelomic fluid from the 6th day onwards and infect all the viscera. The residual forms in the gut gradually disappear and as a rule no motile forms are present after the 18th day. The coelomic forms show a very fine terminal flagellum at each extremity about $\frac{1}{4}$ to $\frac{1}{5}$ the length of the spirochaete. Although they invade all organs they accumulate especially in the salivary glands where they develop into normal spirochaetes resembling the blood forms. Infection is normally transmitted by the introduction of saliva containing spirochaetes when an infected tick feeds, but occasionally the coxal secretion is also infective.

The authors found no evidence of a granule phase and ticks kept at 60° to 85° F. showed essentially the same cycle as those kept at higher temperatures.

E. H.

Jakimow (W. P.). Zur Frage ueber die Rezidivrassen der *Spir. obermeieri* bei experimenteller Rekurrens. Vorläufige Mitteilung. [**The Problem of the Relapse Strains of** *S. recurrentis* **in Experimental Relapsing Fever. Preliminary Note.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1929. Vol. 64. No. 1/2. pp. 9–15. [7 refs.] [Microbiol. Inst., Health Commissariat, Kasan.]

Employing the adhesion test and protective inoculation experiments, the author has studied the relation between the original and relapse strain in the case of animals infected with a Berlin strain of *S. recurrentis*. The relapse strain was only biologically distinct from the original strain in about 50 per cent. of the cases tested. The relapse strain of spirochaetes when passed through successive animals gradually lost its characteristics and reverted to the type of the original strain, which seems to be more stable. This modification occurred in rats inoculated with the relapse strain.

In three cases a completely new type of spirochaete appeared which was biologically distinct from both the original and relapse strains.

The passive immunization of mice with antibodies against the original strain and the subsequent inoculation of the same strain showed that a complete immunity had developed in 40 per cent. of the animals; in 37·5 per cent. an incomplete protection and only in 16 per cent. was the treatment entirely without effect.

E. H.

Rothermundt (Max). Ueber die Beziehungen zwischen Virulenz und Persistenz der Rekurrensspirochäten im Gehirn weisser Mäuse. [**The Relation between the Virulence and Persistence of Relapsing Fever Spirochaetes in the Brains of White Mice.**]—*Arb. a. d. Staatsinst. f. Exp. Ther. u. d. Georg Speyer-Hause zu Frankfurt a.M.* 1928. No. 21. pp. 329–343. [8 refs.] [Georg Speyer House, Frankfurt a.M.]

The author states that in Germany the only strain of relapsing fever known to produce residual brain infections in mice is an African strain of *S. duttoni* kept at the Hamburg Tropical Institute. Experiments have been made with a Russian strain and it was found that animals infected by ordinary subcutaneous or intraperitoneal inoculations never showed persistent brain infections. When, however, mice were infected by percutaneous inoculation, or by feeding on infected material, the mortality and virulence was definitely lowered and these animals showed a more feeble development of antibodies. In these mice persistent brain infections were observed which the author correlates with the lowering in virulence [see this *Bulletin*, Vol. 25, pp. 590 and 592].

E. H.

Igersheimer & Bodenheimer (E.). Experimentelle Rekurrensstudien am Auge. [**Experimental Relapsing Fever Studies on the Eye.**]—*Arb. a. d. Staatsinst. f. Exp. Ther. u. d. Georg Speyer-Hause zu Frankfurt a.M.* 1928. No. 21. pp. 238–251. With 2 text figs. & 4 coloured figs. on 2 plates. [7 refs.] [Georg Speyer House, Frankfurt a.M.]

The authors have studied the effects of three strains of relapsing fever spirochaetes on the eyes of rabbits. In addition the persistence

of the infection in animals inoculated in different parts of the eye is described, from which it seems that the spirochaetes may persist in the cornea after they have disappeared from other parts of the body. The original article should be consulted by those interested in the subject.

E. H.

GRAY (J. D. Allan). **A Study of Experimental Infection by** *Treponema duttoni* **: with a Review of the Literature.**—*Ann. Trop. Med. & Parasit.* 1929. June 27. Vol. 23. No. 2. pp. 241–267. With 2 charts. [4 pages of refs.] [Bact. Dept., Univ., Edinburgh.]

The author has made various experiments on laboratory animals with a strain of *Spirochaeta duttoni* and compares his results with those of other workers. It is of interest that antibodies could not be demonstrated by either *in vitro* or *in vivo* experiments and the spirochaetes of successive relapses in any one animal could not be distinguished by their immunity reactions, and efforts to demonstrate the Pfeiffer reaction failed.

In common with many strains of *S. duttoni* in Europe, the author found that his strain was markedly resistant to organic arsenicals, as shown by the results of experiments with "sulphostab" (diaoxydiamino-arsenobenzol-sodium formaldehyde-bisulphite) and sulfarsenol. A bismuth compound, "bismostab," consisting of a suspension of finely divided bismuth in 5 per cent. glucose solution, also had little or no effect on the disease.

E. H.

CUBONI (Ettore). Infezione sperimentale con "Spirochaeta Duttoni" nel coniglio e nella cavia. [**Experimental Infections of** *Spirochaeta duttoni* **in Rabbits and Guineapigs.**]—*Bol. Istituto Sieroterap. Milanese.* 1929. July. Vol. 8. No. 7. pp. 413–434. [29 refs.] German summary pp. 434–435.

The author tested the effect of a gold salt (Sulfo-crisolo I.S.M.) on mice infected with an arsenic resistant strain of *S. duttoni*. The gold salt was found to cure these infections, but had no effect on mice infected with *Trypanosoma evansi* (2 strains), *T. brucei* (2 strains), and *T. equinum*. Experiments were then made on the susceptibility of rabbits to this strain of *S. duttoni* and it was found that the injection of a small dose sensibilized the animal, and the subsequent injection of other small doses produced a more severe infection than a single intraperitoneal injection of a large dose of infected blood. New-born rabbits were easily infected by both subcutaneous and intraperitoneal injections, and in these animals numerous spirochaetes were present in the blood. The blood serum of rabbits after recovery from the infection immobilized the spirochaetes, but this action was destroyed by heating to 56° C. for 30 minutes, and was not restored by the addition of guineapig complement. Brain infections were very rarely observed in rabbits 20 days, or later, after inoculation.

Guineapigs were infected by the intraperitoneal inoculation of large doses of spirochaetes, and although the organisms were not always detected by microscopical examination, the inoculation of blood into mice proved that they were present in the circulation. New-born guineapigs invariably became infected after either intraperitoneal or subcutaneous inoculation, and also showed relapses 4–5 days after the

original attack. The inoculation into mice of brains from three recovered guineapigs was negative, but in the case of four newly born guineapigs infected with spirochaetosis residual brain infections were found 44 days after the disappearance of spirochaetes from the circulation.

E. H.

Moroder (Juan). Ueber die Züchtung der Rekurrens-Spirochäten. [**The Cultivation of Relapsing Fever Spirochaetes.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1929. Nov. Vol. 33. No. 11. pp. 603–610. [4 refs.] [Inst. for Ship & Trop. Diseases, Hamburg.]

The author has studied cultures of four strains of relapsing fever in a simple medium consisting of inactivated rabbit or horse serum, diluted with normal saline solution (1 : 2–5) and covered with a layer of paraffin. His observations help to explain many of the inconstant results of previous workers, for often cultures which were completely negative to microscopic examination for spirochaetes produced infection when inoculated into mice, or showed spirochaetes in subcultures. Very often these seemingly negative cultures showed small granules, resembling micrococci, but cultures on agar slopes showed that these were not contaminating organisms. Out of 17 mice inoculated with cultures showing no trace of spirochaetes, 15 became infected with spirochaetosis after an incubation of 2 to 4 days.

E. H.

Moretti (P.). Sulla resistenza della spirocheta della febbre ricorrente al neosalvarsan nelle infezioni sperimentali. (Nota II). [**The Resistance of Relapsing Fever Spirochaetes to Neosalvarsan.**]—*Giorn. di Batteriol. e Immunol.* 1929. Jan. Vol. 4. No. 1. pp. 3–8. [18 refs.] [Inst. of Path. & Clin. Med., Univ., Messina.]

The author set out to study the fact that arsenical compounds, efficacious in the earlier stages of relapsing fever, may be ineffectual if a prolonged period such as 100 days is allowed to elapse between experimental infection with the spirochaete and the giving of the drug. He found that in some cases (mice were used) even after so long as 219 days neosalvarsan succeeded in ridding the brain of spirochaetes, but that the operation of splenectomy or blocking of the reticulo-endothelial system greatly reduced, if it did not entirely abrogate, the effect of the drug; hence the integrity of this system is believed to be a *conditio sine quâ non* for successful chemotherapy of this disease.

H. Harold Scott.

Howard (A.). Action préventive et curative du thiopropanol sulfonate double d'or et de sodium (allochrysine) dans la spirillose des poules (*Sp. gallinarum*) et la fièvre récurrente de la souris (*Sp. duttoni*). [**The Preventive and Curative Action of Allochrysine in Fowl Spirochaetosis** (*S. gallinarum*) **and Relapsing Fever in Mice** (*S. duttoni*).]—*C.R. Soc. Biol.* 1929. July 17. Vol. 101. No. 24. pp. 927–928. [3 refs.]

Allochrysine is a thio-propanol sulphonate of gold and sodium ($C_6H_{13}O_2S_4Au\,Na_2$) and is less toxic than other gold salts. It has been

used successfully in the treatment of experimental syphilis, and the results in the present article show clearly that it has both a curative and also protective action in fowls infected with *S. gallinarum* and mice infected with *S. duttoni*. It has no action on *Trypanosoma brucei* infection in mice.

E. H.

NOHIRA (A.). **An Experimental Study of Hereditary Immunity from Relapsing-Fever. (The First Report.) The Resistance against Infection (Hard or Difficult Infectiousness) of the Offspring of Infected Mice.**—*Japan Med. World.* 1929. Mar. 15. Vol. 9. No. 3. pp. 83–84. [1 ref.] [Dermat. Clinic, Imperial Univ., Kyoto.]

The offspring of mice infected with a Manchurian strain of relapsing fever were tested concerning their immunity to infection. When a normal mother was paired with an immune male, the resulting offspring showed no immunity; but when the mother was immune, the offspring also showed a certain degree of resistance to infection. The resistance of the young rarely lasted for more than 60 days after birth. The results indicate that the immunity is the result of immune bodies passing through the placenta from the mother, and not to antenatal infection of the young themselves.

E. H.

NOHIRA (A.). **An Experimental Study of Hereditary Immunity from Relapsing-Fever. (The Second Report.) The Resistance against Infection of Brothers of an Infected Mother Animal.**—*Japan Med. World.* 1929. Apr. 15. Vol. 9. No. 4. pp. 119–121. [Dermat. Clinic, Imperial Univ., Kyoto.]

The author has made detailed experiments with the offspring of infected mice, and found that when born within 14 to 54 days of the mother's infection, the young rarely showed any inherited immunity against infection with relapsing fever. When a longer period, 90 to 117 days, elapsed between infection and birth, the offspring showed a much higher degree of resistance. The examination of successive litters of the same animal showed that in some cases only one litter had a high degree of resistance, litters both before and after being susceptible to infection. In other cases a succession of litters were resistant, the immunity persisting for a considerable period. This resistance is evidently the result of immune bodies passing from the blood of the mother into the foetus, for when the mother was found to be susceptible to reinfection, the offspring never showed any inherited immunity. The examination of different individuals of the same litter showed that the inherited immunity gradually diminishes with age. Within 30 days after birth the young often had a high degree of immunity, but after 60 days very few individuals were found to show any resistance.

E. H.

Belezki (W. K.) & Umanskaja (R. M.). Ueber die Natur der Immunität bei Rückfallfieber. VII. Morphologische Untersuchung der Schutzfunktionen bei Rückfallfieber des Menschen. [**Nature of Immunity in Relapsing Fever. VII. A Morphological Study of the Protective Mechanism in Human Cases of Relapsing Fever.**]—*Virchows Arch. f. Path. Anat.* 1929. May 18. Vol. 272. No. 2. pp. 305–312. With 5 text figs. [5 refs.] [Microbiol. Research Inst., Education Commissariat R.S.F.S.R., Moscow.]

The author has studied the histology, with special reference to the appearance of the spirochaetes, in three human patients who died of relapsing fever during the infection. As a result of his observations, the author considers that antibodies, spirochaetolysins, play the most important part in protection against the spirochaete, as evidenced by the gradual dissolution of the organisms in the organs and blood circulation. Phagocytosis, although it takes place, is comparatively feeble and plays a very subordinate part in the disappearance of the spirochaetes. The phagocytic action depends on the cells of the reticulo-endothelial system, the round histiocytes, and the monocytes of the blood. In the brain the glia and Hortega cells act as phagocytes.

E. H.

Aristowsky (W. M.) & Wainstein (A. B.). Rekurrens-Schutzimpfungsversuche [am Menschen. 2. Mitteilung. [**Experiments on Protective Inoculation against Relapsing Fever in Man.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1929. Vol. 63. No. 3/4. pp. 240–249. [Microb. Inst., Tatar Health Commissariat, Kasan.]

A continuation of experiments previously recorded [see this *Bulletin*, Vol. 26, p. 656]. The authors inoculated patients with a vaccine composed of a mixture of cultures of both the original and relapse strains of *S. recurrentis*, which after being incubated at 37° C. for 3 days were subsequently kept at room temperature for 14–16 days until they had lost their virulence. Each patient received three injections of this mixture (1·0, 1·5 and 2·0 cc.) at 3-day intervals. A week after the last injection the blood was found to contain spirochaetolysins against both original and relapse strains, and two of the patients were inoculated with living spirochaetes of both strains respectively without becoming infected. These results show that it is possible to produce immunity by the inoculation of dead spirochaetes, and support the view that in relapsing fever immunity does not depend on a persistent infection, as suggested by certain authors, but is the result of the development of spirochaetolysins, etc., in the blood, causing a "sterile" immunity.

E. H.

Weiss (Emil). **A Simple Method for Staining Spirochetes.**—*Jl. Lab. & Clin. Med.* 1929. Sept. Vol. 14. No. 12. pp. 1191–1193. [3 refs.]

Spirochaetes are stated to have a greater affinity for acid dyes, whilst bacteria preferably take basic dyes. The author has found that various mordant methods such as those used for flagella give good results with

spirochaetes, but it is difficult to avoid general precipitation on the film, and most mordants do not keep. The following method has been found to give the best results :—

The material containing spirochaetes is placed on a slide in a drop of 5 per cent. acetic acid. The slide is inverted over a hollow ground slide and placed in the incubator for 15 minutes. The drop is then spread on the slide and allowed to dry. The slide is then covered with the mordant and gently heated until it steams. The most useful mordant is prepared by mixing one part of a solution of 100 gm. tannic acid in 100 cc. of 95 per cent. alcohol, with two parts of a solution consisting of undiluted formalin containing 7·5 per cent. acetic acid. After 2 to 5 minutes the excess mordant is washed off with warm water and the film then stained with combinations of acid and basic dyes, of which the following are recommended : gentian violet and acid green ; safranine or fuchsin with acid green ; brilliant green with acid violet or acid fuchsin. The slides are first stained for 2–5 minutes in a saturated aqueous or alcoholic solution of the basic dye, washed off with warm or cold water and then covered for 8–10 minutes with the acid dye dissolved in 30 per cent. alcohol. The slides are then washed in water and allowed to dry without heating. .

E. H.

Goldie (Horatio). Beobachtungen ueber die Spirochätenenteritis. [**Notes on Spirochaetal Enteritis.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1929. June. Vol. 33. No. 6. pp. 313–322. [58 refs.]

Three cases attributed to this disease were studied by the author in Palestine, who gives details of the symptoms and treatment. All three had periodical attacks of diarrhoea, when the stools were slimy or purulent and contained blood. Microscopical examination showed large numbers of spirochaetes or epithelial cells and the general appearance suggested the existence of a chronic ulcerative condition. Protozoa and bacillary infections were excluded, and the author considers that these were cases of the ordinary saprophytic spirochaetes producing secondary infections in the intestine. They belonged to the type of case described by Luger. All three were cured by treatment with stovarsol.

E. H.

Gardner (G.). Nouvelle contribution à la biologie des spirochétidés. [**A New Contribution to the Biology of Spirochaetes.**]—*Univ. Montréal Lab. de Biol. Contrib. 6.* 1929. 43 pp. With 11 figs. [39 refs.]

A record of observations on spirochaetes in Canada, especially of forms obtained from cultures of hay. The author makes the curious statement that tuberculinized cattle never show spirochaetes in the mouth or the faeces, and suggests the possibility of some association between these organisms and the tubercle bacillus.

E. H.

de Mello (I. Froilano). Sur le commensalisme de la faune spirochétique dans les arcades dentaires et dans l'intestin de l'homme et des animaux. [**On the Commensalism of the Spirochaetal Fauna in the Gums and in the Intestine of Man and Animals.**]—*Far Eastern Assoc. Trop. Med. Trans. Seventh Congress, British India, 1927.* Vol. 2. pp. 465–477. [10 refs.]

This paper is essentially the same as that reviewed in this *Bulletin*, Vol. 26, p. 123, but the author gives full details of all measurements, etc.

The gums in both man and animals show a very similar spirochaetal fauna, and several domestic animals contain in the intestine a form indistinguishable from *S. eurygyrata*. Morphological methods, especially the various methods of measurement devised by the author, are considered to be of help in distinguishing the species and to show their homologies.

E. H.

Balbi (E.) & Chinaglia (A.). Sulla presenza di spirochete nel sangue di soggetti malati e sani. Nota preventiva. [**Spirochaetes in the Blood in Health and Disease.**]—*Riforma Med.* 1929. Sept. 28. Vol. 45. No. 39. pp. 1311–1312. With 1 text fig. [Dermosyph. Clinic, & Inst. of Path. Anat., Univ., Padua.]

The authors took blood by venepuncture with a syringe sterilized at 180° C. for 20 minutes, and placed it in broth sterilized on three successive days for 30 minutes at 115° C. Examination by dark-ground illumination from the third to the eighth days showed spirochaetes in considerable numbers, after which time they rapidly decreased. The broth alone showed none. They could not be detected on staining. They were found in all but two of 49 patients suffering from various diseases—syphilis, tuberculosis, scabies, colitis, gonorrhoea and others—and in 14 out of 16 healthy subjects. The dimensions of the spirochaete, which is denominated " Haematospira hominis," were 6–25 microns in length and 0·3–0·4 wide, with refractile ends.

H. Harold Scott.

[It is obvious that the authors merely observed degenerated blood cells.]

E. H.

Ghetti (G.). Su di un caso di pseudotubercolosi da Spirocheta bronchiale del Castellani.—*Arch. Ital. Sci. Med. Colon.* 1929. Apr. 1. Vol. 10. No. 4. pp. 177–181. English summary p. 181. [Inst. Colonial Path., Univ., Bologna.]

Manieri (Alberto) & Gori (Pio). Observations sur l'infection récurrente expérimentale du lapin. (*Spirochaeta Duttoni.*)—*Bol. Sezione Ital., Soc. Internaz. di Microbiologia.* Milan. 1929. Jan. Vol. 1. No. 1. pp. 19–21. [Inst. of General Path., Univ., Florence.] [v. this *Bulletin*, Vol. 26, p. 663.]

de Mello (Froilano) & Fialho. Sur les spirochètes commensaux des arcades dentaires et de l'intestin de l'homme et des animaux.—*Giorn. di. Batter. e Immunol.* 1928. Oct. Vol. 3. No. 10. 23 pp. With 32 figs.

LEPTOSPIROSIS.

SCHÜFFNER (W. A. P.). De ziekte van Weil in Cliniek en Laboratorium. [**Clinical and Laboratory Aspects of Weil's Disease.**]—*Nederl. Tijdschr. v. Geneesk.* 1929. Oct. 5. 73rd Year. 2nd Half. No. 40. pp. 4707–4726. [Bijblad pp. 247–266]. With 1 plate facing p. 4713, 1 map & 8 charts.

Since the Institute of Tropical Hygiene at Amsterdam began to study the question of Weil's disease in 1924, 46 cases, of which 10 were fatal, have been investigated. Cases occurred in every month of the year, but the majority were found in August (5), September (11), and October (5). It was a remarkable fact that 3 cases occurred in December and another 3 in January, when contact with open water, the chief aetiological factor, is least likely to take place. In not less than 20 cases, indeed, there was a history of a fall, accidental or suicidal, into water, and in most of these cases the persons had been immersed for some time and some had been taken out in an unconscious condition.

It is true that the disease is only an exceptional sequel of such an accident, as since April 1928, 127 persons in Amsterdam had fallen into the water without subsequently developing Weil's disease.

In 7 cases there was a history of swimming, and 5 of the patients had been in constant contact with water (seamen and slaughtermen), while in 13 there was no indication as to how the disease was contracted.

Of the 46 cases 36 had definite jaundice, 9 had no jaundice and in 1 the presence of jaundice was doubtful. The diagnosis was established in 11 by cultivation of *Leptospira icterohaemorrhagiae*, and in 35 by serological examination only. As regards their topographical distribution, Amsterdam and Rotterdam headed the list with 15 and 11 cases respectively, and, generally speaking, the disease was more prevalent in the water district than in the meadow land.

Schüffner's conclusions are as follows :—

(1) In cases of acute fever of which the cause is not obvious, one should think of leptospirosis as well as influenza. Only a certain proportion of the cases show jaundice.

(2) The possibility of the diagnosis is all the greater when there is a history of a fall into the water or of much bathing.

(3) If the onset is severe, serum should be given without delay, as the sooner it is given, the more powerful its effect. When once jaundice has appeared the serum is useless.

J. D. Rolleston.

HOESCH (K.). Zur Klinik der Weilschen Krankheit. [**A Clinical Study of Weil's Disease.**]—*Ztschr. f. Klin. Med.* 1929. May 31. Vol. 110. Nos. 4 & 5. pp. 557–577. With 2 text figs. [14 refs.]

Observations on previous epidemics and on two very typical cases of Weil's disease have led the author to the opinion that many cases of this infection have the appearance of ordinary catarrhal jaundice. In both cases there is often hepatic coma with inflammation of the bile-ducts, resulting in the development of uraemia, and the author gives the results of blood analyses supporting this view.

The kidney is also affected in Weil's disease, as shown by the diminution of the phosphorus fraction of the blood and the renal insufficiency. As a result of the clinical study of the disease it is evident that it should be regarded as a hepato-nephritis with suppurating cholangitis.

E. Hindle.

Epstein (H.) & Tarassow (S.). Zur Ätiologie des sogenannten Schlamm- oder Wasserfiebers. [**On the Causation of Marsh or Water Fever.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1929. Apr. Vol. 33. No. 4. pp. 222–223. [Metchnikoff Inst. for Infectious Diseases, Moscow.]

It had been suggested that this fever might be allied to Weil's disease; accordingly, when a fresh outbreak occurred near Moscow, Dr. Tarassow was sent to investigate.

The patients had high fever, with severe pain in the back and loins and slight yellowness of the conjunctiva.

On the second and third days of the illness 10–20 cc. of blood were drawn off from a vein from these patients. This blood was injected into guineapigs intraperitoneally, and cultures were also made on media suitable for the growth of leptospira. Fifty cultures in all were made, but only 39 safely reached the Metchnikoff Institute in Moscow. From the first case, in three of the cultures numerous leptospira appeared after 12, 20 and 65 days respectively. From the second case one culture was also successful. In the third patient all the cultures were sterile.

The leptospira isolated were morphologically identical with *L. icterohaemorrhagiae*. It is therefore likely that at least some of the cases diagnosed as marsh fever are really Weil's disease.

D. Harvey.

Strasburger (J.) & Thill (O.). Klinik der Weilschen Krankheit. Mit Mitteilung von zwei neuerding beobachteten Fällen. [**The Symptoms of Weil's Disease. With Notes on Two Recent Cases.**]—*Klin. Woch.* 1929. July 23. Vol. 8. No. 30. pp. 1391–1395. With 2 graphs in text. [19 refs.] [Med. Polyclinic, Univ., Frankfurt a.M.]

A very detailed account of the clinical symptoms and course of this disease in two patients at Frankfurt, who both seem to have acquired the infection as a result of bathing in the river Main during the warm summer of 1928. Methods of distinguishing Weil's disease from other infections are also discussed.

E. H.

Troisier (Jean), Leon-Kindberg & Monnerot-Dumaine (M.). Recrudescence estivale de la spirochétose ictéro-hémorragique provoquée par les bains de rivière. [**The Summer Recrudescence of Spirochaetal Jaundice produced by River Bathing.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1929. Oct. 21. Year 45. 3rd Ser. No. 26. pp. 1161–1163.

The record of a case of this disease in a patient who habitually bathed in the Seine at Asnières and became infected in September. In the discussion

following the paper, six other cases were mentioned, in all of which infection seemed to have been acquired by bathing in water containing the spirochaetes.

E. H.

Brulé (M.) & Stéhelin. Spirochétose ictéro-hémorragique sans azotémie pendant la rémission thermique. [**Spirochaetal Jaundice without Azotemia during the Febrile Relapse.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1929. July 22. Year 45. 3rd Ser. No. 25. pp. 1043–1047. [6 refs.]

Details of a case of this disease in Paris which is of interest, as the patient during the relapse showed no trace of any increase in the urea content of the blood, which, as a general rule, rises considerably during this period.

E. H.

Sanarelli (G.) & Pergher (G.). Patogenesi delle spirochetosi itterogene. [**Pathogenesis of Spirochaetal Icterus.**]—*Ann. d'Igiene.* 1929. June. Vol. 39. No. 6. pp. 401–433. With 8 coloured figs. on 2 double plates. [27 refs.] [Hyg. Inst., Univ., Rome.]

This article follows up one published three months previously (this *Bulletin*, Vol. 26, p. 669). The authors describe the pathological effects of *L. icteroides*, *L. icterohaemorrhagiae*, and *Sp. autumnalis* alone and complicated by secondary invaders to which they ascribe most, if not all, of the lesions produced. They seem to regard the first as a valid organism distinct from the second. The following is a summary of their conclusions :—

1. *L. icteroides* can live and multiply for a long time in the body of a guineapig without producing marked anatomical changes. Such, when present, are due to ancillary organisms, coliform bacilli for example, the leptospira then being no longer recoverable.

2. Experiments *in vitro* show that spirochaetes are endowed with very faint powers of resistance to such antagonistic organisms.

3. The secondary invaders (microbi di sortita) isolated from animals infected with spirochaetes have not such virulence as would account for the anatomical conditions found at autopsy.

4. Animals when attacked by these invading organisms behave in exactly the same way whether the primary infection is by *L. icteroides*, *L. icterohaemorrhagiae*, or *Sp. autumnalis*.

5. Invasion by the organisms occurs towards the end of the febrile attacks due to the spirochaetosis, or soon after. This critical apyrexial period is denominated " crisis nefasta " in contradistinction with the " crisis benefica " of acute infective diseases.

6. The invading organisms are usually the same for the same animal : For guineapigs, streptococci or, rarely, one of the paratyphoids ; for rabbits, one of the Coli group ; for young dogs, streptococci, colon bacilli, staphylococci, and paratyphoids ; for man, one or other of the last named.

7. This secondary invasion is facilitated, not by a reduced bactericidal power of the blood-plasma, but by overthrow of the protective functions of the liver.

8. The degree of change observed is not ascribable to the tissue-reaction to the spirochaetes, this being always the same, but to the action of the invading organism alone, or in combination with others. The spirochaetes

alone are incapable of causing the death of the animals. Death, when it results, is due to inflammatory or suppurative processes in lungs, liver, spleen, etc., by cachexia or leading to a generalized septicaemia.

H. Harold Scott.

Sanarelli (G.) & Pergher (G.). Pathogénie des spirochétoses ictérogènes (troisième mémoire). Les " crises néfastes " dans les spirochétoses. [**Pathogeny of Icterogenic Spirochaetosis (3rd Memoir). The " crises néfastes " in Spirochaetoses.**]—*Ann. Inst. Pasteur.* 1929. July. Vol. 43. No. 7. pp. 908–954. With 2 coloured figs. on 1 plate. [91 refs.]

This paper is a continuation of the arguments advanced in the two preceding memoirs and also in the article reviewed above. The authors' views can hardly be taken seriously. In the case of yellow fever they put forward the hypothesis that *Leptospira icteroides* is the aetiological agent of the disease and Sanarelli's " *Bacillus icteroides* " is a secondary infection producing the symptoms of the disease. Many of the statements in the paper are surprisingly inaccurate, such as one to the effect that if Noguchi's death was the result of laboratory infection with yellow fever, it would be the first authentic case of its kind !

E. H.

Uhlenhuth (P.) & Seiffert (W.). Untersuchungen ueber die Ausheilung der Weilschen Krankheit bei Meerschweinchen unter der Behandlung mit Bismuto-Yatren A. [**Investigations on the Treatment of Weil's Disease in Guineapigs by the Use of Bismuth Yatren A.**]—*Zent. f. Bakt.* I. Abt. Orig. 1929. Oct. 31. Vol. 114. No. 4/6. pp. 241–251. [4 refs.] [Hyg. Inst., Univ., Freiburg i.B.]

This paper is a continuation, with experimental details, of those reviewed in this *Bulletin*, Vol. 25, p. 609, and Vol. 26, p. 672. The results of treating infected guineapigs with Bismuth Yatren A show that this compound does not act on the spirochaete, but on the protective mechanism of the host. Guineapigs that had been cured by injections of this compound were killed 3 to 6 weeks later and their organs inoculated into normal animals, none of which became infected, showing that the spirochaetes had disappeared completely. These treated guineapigs were found to be resistant against reinfection 4 to 12 weeks later, and their blood contained passive immune bodies. The protection against reinfection does not depend on the persistence of the compound in the internal organs, for the analysis of the liver showed that the bismuth is eliminated after 3 to 5 days.

The most significant evidence of the indirect action of the drug is the fact that if it is injected soon after the inoculation of the spirochaetes it has no effect on the course of the disease, which is a strong argument against the view that the organisms are directly killed by the drug. It would seem that the action of this compound is in some way bound up with the development of the natural resistance of the host.

E. H.

Damon (S. R.) & Hampil (Bettylee). **Studies on Leptospirae. I. Some Observations on the Distribution and Cultivation of Leptospirae.**—*Jl. Bacteriology.* 1929. Nov. Vol. 18. No. 5. pp. 343–359. [8 refs.] [School of Hyg. & Public Health, Johns Hopkins Univ., Baltimore, Md.]

An account of the examination of 131 samples of water from 47 different sources, collected at different times of the year, mainly in the neighbourhood of Baltimore or Washington. The authors cultured each water sample in Petri dishes containing a medium composed of 0·33 per cent. agar and 0·33 per cent. egg yolk in tap water; four cultures were made from each sample and two were kept at room temperature and two at 37° C. The interesting result has been brought to light that some of these water leptospira grow at 37° C., whilst others will only grow at room temperature. Seventy-three samples gave positive cultures, of which 40 were positive at 37° C. and 72 at room temperature, and the authors are of the opinion that these are distinct strains of leptospira. When the water samples were stored in the laboratory, it was found that the strain which grew at 37° C. died out much sooner than that which grew at room temperature. The samples were taken from a great variety of sources, and of 24 spring waters only one from a contaminated well was positive for leptospira, whilst of 69 surface waters, 57 were positive. Apart from this, there was no evidence of faecal contamination being necessary, and some of the negative spring waters had frogs and toads living in them. Chlorination was found to destroy the leptospira, but municipal waters negative when leaving the filtration plants were found to acquire the infection on passage through the city mains.

E. H.

Kagaya (Kiichi). **The Experimental Study on the Difference between the *Leptospira icterohaemorrhagiae* and the Water Leptospira.**—*Japanese Jl. Experim. Med.* 1929. Aug. 10. Vol. 7. No. 3. pp. 393–407. [31 refs.]

A record of experiments on the nature of various strains of leptospira which are opposed to the view that all pathogenic forms are merely varieties of the common water leptospira. Cultures of the water leptospira in 10 per cent. rabbit serum never became virulent to guineapigs, even in the 72nd generation. When injected intraperitoneally into both guineapigs and mice, they never survived for more than 10 hours, as tested by cultures from various parts of the body. Numerous attempts were made to infect rats and guineapigs, using every conceivable method of inoculation, combined with malnutrition and the use of aggressins, but the results were uniformly negative. A guineapig was inoculated with 10 cc. of a culture of water leptospira, and after five hours the peritoneal exudate was removed and mixed with actively motile water forms. "The action of the leptospira was disturbed after 1 to 3 hours, but became again active after 20 hours." When the water leptospira and *L. icterohaemorrhagiae* were both exposed to the action of this exudate at 39 to 41° C., the water forms became inactive in 7–8 hours, and completely non-motile in 12 hours, whilst the pathogenic strain was unaffected.

The virulence of three pathogenic strains of leptospira was artificially lowered in cultures, so that they failed to produce infection when

inoculated into guineapigs, and thus superficially resembled the water forms. When, however, these pathogenic strains of low virulence were inoculated into guineapigs and rats, they persisted in the bodies of these animals for many days, up to as long as 75 days in the case of a rat. Water leptospira, on the contrary, rapidly disappeared after being inoculated. Details are then given of passage experiments, by means of which some of the strains of weakened virulence were again made fully virulent, but similar experiments with water forms gave negative results. Agglutination tests with the original pathogenic strain, the weakened strain, water leptospira, and the virulence recovered strain, and the four corresponding immune sera, showed that the three pathogenic forms were identical, but very distinct from the water form.

As a result of the author's observations, he is of opinion that *Leptospira icterohaemorrhagiae*, *L. hebdomadis* (including *L. Akiyami B*), *L. Akiyami A*, and the water leptospira are entirely distinct, and do not change from one form into another.

E. H.

KAGAYA (Kiichi). **A Critical Investigation on Type-Problem existing among Strains of** *Leptospira Ictero-Haemorrhagiae* **found in Japan.**—*Japanese Jl. Experim. Med.* 1929. Aug. 10. Vol. 7. No. 3. pp. 409–412. [13 refs.]

The author tested 11 strains of *L. icterohaemorrhagiae*, and although one of these was found to be difficult to agglutinate, they all agree in their reaction to the lytic action of immune sera. None of these strains was affected by a water-leptospira immune serum.

E. H.

MITANAGA (Kazuyoshi). Ueber die Gruppenreaktion zwischen *Spirochaeta ikterohaemorrhagiae* und *Spirochaeta Akiyami*-A. [**The Group Reactions between** *L. icterohaemorrhagiae* **and** *L. Akiyami*-**A.**] —*Nagoya Jl. Med. Sci.* 1928. Oct. 25. Vol. 3. No. 2. pp. 85–95. [33 refs.] [Inst of Hyg. & Bact., Aichi Univ., Nagoya, Japan.]

The author prepared a very strong antiserum against *L. icterohaemorrhagiae* by inoculating a rabbit in the liver with 2·0 cc. of an emulsion of virulent spirochaetes from the liver of an infected guineapig. Subsequently, the rabbit at 4–5 days' intervals was inoculated intravenously 6–10 times with increasing doses of a culture of the organism. This serum agglutinated in dilutions of 10,000 to 20,000. Cultures of *Akiyami* A and *icterohaemorrhagiae* respectively were made in the presence of various dilutions of immune sera, and it was found that *Akiyami* A antiserum in dilutions of 1/320 prevented the growth of the homologous strain, whilst *icterohaemorrhagiae* grew in dilutions of 1/20 to 1/40. Similar results were obtained with *icterohaemorrhagiae* immune sera acting on the homologous and heterologous strains. Agglutination tests were made by putting 2 cc. of 0·4 to 0·5 per cent. agar dissolved in Ringer into small tubes, then sterilizing at 100° C. and adding 0·5 cc. of the dilution of the immune serum and mixing with the agar. Then a drop of the suspension of spirochaetes to be tested

was added to each tube, and the mixture incubated for three days at 37° C. The results showed that the homologous antiserum was 80 to 160 times more active than the heterologous one, but strong dilutions of both antisera agglutinated the heterologous strain. Similar results were obtained with Pfeiffer's reaction. Finally 24 guineapigs were injected with *Akiyami* A antiserum, and subsequently 12 with *Akiyami* A spirochaetes, and 12 with *icterohaemorrhagiae*. Of the latter, two died, whilst all the others lived. By using *icterohaemorrhagiae* antiserum, the opposite result was obtained, two out of 12 of the *Akiyami* A dying and the others all surviving. But the protective influence of the immune sera was evident even with the heterologous strains, for unprotected control animals inoculated with either strain all died of the infection.

It seems, therefore, that these two strains are closely related, but may be distinguished by the above-described tests.

E. H.

Middleton (A. D.). *Leptospira icterohaemorrhagiae* **in Oxford Rats.**—*Jl. Hygiene.* 1929. July. Vol. 29. No. 2. pp. 219–226. With 3 text figs. [5 refs.] [Dept. of Zool. & Comparative Anatomy, Univ. Museum, Oxford.]

The author found that out of 235 rats collected in the Oxford district during June and July 1928, and January to March 1929, 41·7 per cent. contained *Leptospira icterohaemorrhagiae* in their kidneys. The percentage infection increased from nil in very young rats up to a maximum of 56 per cent. in fully grown individuals, with a slight diminution in the oldest rats. Sixteen house mice, two dormice and one rabbit were examined with negative results. Water leptospirae were found in several localities, but attempts to infect guineapigs with them gave negative results, whilst the rat forms were pathogenic to guineapigs.

[The author's results confirm previous observations on this subject made in London by Stevenson and Foulerton [see this *Bulletin*, Vol. 15, p. 171 ; Vol. 19, p. 323] and by Coles in Bournemouth. No reference is made to these publications.]

E. H.

Ssinjuschina (M. N.). Zur Frage der Epidemiologie des infektiösen Ikterus in Moskau. [**The Problem of the Epidemiology of Infective Jaundice in Moscow.**]—*Zent. f. Bakt.* I. Abt. Orig. 1929. Oct. 15. Vol. 114. No. 3. pp. 199–203. [14 refs.] [Microbiol. Research Inst., Education Commissariat R.S.F.S.R., Moscow.]

The author examined 60 wild rats in Moscow and found 7 of them infected with *Leptospira icterohaemorrhagiae*. The thrombocytobarin reaction for this spirochaete gave uniformly negative results with the sera of all these 60 rats and consequently the author considers the method unreliable. The best method was found to be the cultivation of leptospira in a medium containing the serum of the rat under

examination, the presence of immune bodies in this serum preventing the growth of the organisms. In this way it was possible to discover infections which could not be recognized by any other methods.

E. H.

Bessemans (A.) & Thiry (U.). Sur une leptospirose spontanée de la souris. [**On a Spontaneous Leptospirosis in Mice.**]—*C.R. Soc. Biol.* 1929. June 14. Vol. 101. No. 20. pp. 486–489. [2 refs.] [Inst. of Hyg. & Bact., Univ., Ghent.]

The authors previously recorded the production of fatal infections in mice by the inoculation of cultures of leptospira from Ghent tap water [see this *Bulletin*, Vol. 26, p. 671]. From the 22nd subculture this organism lost its virulence, and when inoculated into mice produced no apparent symptoms, but these inoculated animals became carriers of the virus and leptospira could be found in their urine. The authors then examined mice from different localities in Ghent and found that 17 young individuals were all uninfected, of 21 adults 6 were infected, and of 21 old mice all but 2 were infected. These results confirm the view that the Ghent water contains this pathogenic strain, for mice from Louvain and Germany were all negative. Infected mice rarely show leptospira in the blood, but the urine is always positive, although no other signs of infection can be detected, and even the kidney is normal in appearance. The subcutaneous inoculation of infected urine or kidneys containing leptospira gave negative results. When normal mice were kept in the same cage as infected ones, they became infected after about two months. When urine containing leptospira was introduced into the mouths of normal mice infection was readily produced, sometimes after an incubation of only 7 days, so the normal method of transmission seems to be *per os*. The infection is not hereditary. Serologically this strain of mouse leptospira was found to be distinct from both *L. icterohaemorrhagiae* and an ordinary water strain. This spontaneous infection with leptospira in Ghent mice seems to be the result of mice ingesting water containing the organism, but the origin of the pathogenic strain previously recorded is not quite clear.

E. H.

Saenz (A.). Infection transplacentaire du cobaye par le spirochète ictéro-hémorragique. [**Infection through the Placenta of the Guineapig with** *L. icterohaemorrhagiae*.]—*C.R. Acad. Sci.* 1929. May 27. Vol. 188. No. 22. pp. 1455–1456. [1 ref.]

The author inoculated a pregnant guineapig with this organism and 5 days later removed the placenta and a 6 cm. foetus. A guineapig inoculated with an emulsion of this foetus died of spirochaetal jaundice 7 days later, whilst a second animal inoculated with the placenta died of the same infection after 13 days. A second pregnant guineapig was infected 6 days before the birth of two young ones, both of which were found to contain the spirochaete, but two young ones born dead 16 hours after the mother had been inoculated were found to be free from the infection.

E. H.

DE LAVERGNE & FLORENTIN (P.). Lésions de spirochétose ictéro-hémorragique chez le cobaye. Ictère et purpura. [**The Lesions of Spirochaetal Jaundice in the Guineapig.**]—*Bull. Soc. Française Dermat. et Syph.* 1929. Jan. No. 1. p. 54 (R.N. p. 18).

The demonstration of a case of this disease in a guineapig.

E. H.

DONOMAE (Imago). **Clinical and Experimental Studies of Lipoid Metabolism in Leptospira-icterohemolytica.**—*Nisshin Igaku* (*Jl. Progressive Med.*). 1929. May. Vol. 18. No 9. [Summarized in *Japan Med. World.* 1929. July 15. Vol. 9. No. 7. pp. 231–232.]

The author analysed the blood and organs of guineapigs infected with spirochaetal jaundice, records being kept of the body weights and temperatures during the course of the infection. The results indicate that there was no marked difference in the water content of the blood during the febrile period, but with the access of jaundice it increased. The total fatty acids and lecithin were increased during both periods and the cholesterin markedly decreased. The water content in the liver, kidney, spleen and supra-renal increased during both the febrile and jaundice periods, but there was no change in the heart, skeletal muscles and testes. The quantity and ratio of lipoids remained constant.

The total fatty acids and lecithin in the supra-renal were the same, but cholesterin increased slightly during the febrile period. During the jaundice period the first two were slightly, and the last markedly, decreased. The ratio of total fatty acids and lecithin was not changed, but the lecithin and cholesterin ratio was slightly lowered during the febrile period and markedly increased during the jaundice period.

E. H.

KINGSBURY (A. Neave). **An Attempt to transmit** *L. icterohaemorrhagiae* **by** *A. argenteus* **and** *A. albopictus.*—*Far Eastern Assoc. Trop. Med. Trans. Seventh Congress, British India, 1927.* Vol. 2. pp. 544–547. [3 refs.] [Inst. for Med. Research, Kuala Lumpur, F.M.S.]

The author fed *Aëdes argenteus* and *A. albopictus* on guineapigs infected with a virulent strain of *Leptospira icterohaemorrhagiae*, when the organisms were present in the blood. Subsequently these mosquitoes were fed on normal guineapigs. In no case was any infection produced, and three weeks after the original feeding the surviving mosquitoes were dissected and examined for leptospirae with negative results.

E. H.

ADAMSKI (J.). Eine Agarmethode zur Reinzüchtung von Wasserspirochäten, insbesonders vom Weiltyp. [**An Agar Method for the Pure Culture of Water Spirochaetes, especially of the Weil Type.**]—*Zent. f. Bakt.* I. Abt. Orig. 1929. June 28. Vol. 112. No. 6/8. pp. 476–480. [6 refs.] [Microbiol. Inst., Univ., Posen.]

This method depends on the greater motility of spirochaetes, in a viscous medium, in comparison with that of spirilla and ordinary bacteria. In a medium containing 1·2 to 1·5 per cent. agar the spirochaetes are able to penetrate into the depth of the medium, whilst bacteria remain on the surface.

The author uses a medium containing 1·2 to 1·5 per cent. agar and 0·25 per cent. human faeces ; the mixture is steamed, filtered, the pH adjusted

to 7 to 7·2, and finally autoclaved for 15 minutes at 120° C. The medium is then poured in Petri dishes in a layer 1 to 1·5 cm. thick. When the surface is moderately dry, the plate is inoculated in the centre with the material containing spirochaetes and the plates, bottom downwards, are incubated at room temperature for 8 to 15 days. The spirochaetes can be obtained from the depths of the agar and pure cultures can be made by transferring to any suitable medium, such as Noguchi's serum agar. If the water to be examined contains few spirochaetes it is advisable to enrich the growth by Hindle's method before inoculating the agar plates. By these means the author has been able to cultivate leptospirae from almost every sample of water examined, and the method is also recommended for the isolation of water spirochaetes of the *buccalis* or *Treponema* type.

E. H.

RAT-BITE FEVER.

Grabow (C.) & Struwe (F.). Beitrag zum Vorkommen des Erregers der Rattenbisskrankheit (*Spirillum morsus muris*) und zu seinem Verhalten im Tierversuch. [**A Study of the Appearance of the Causative Agent of Rat-Bite Fever** (*S. morsus muris*) **and its Behaviour in Animal Experiments.**]—*Zent. f. Bakt.* I. Abt. Orig. 1929. Aug. 21. Vol. 113. No. 5/6. pp. 418–425. [28 refs.]

The author isolated two strains of this organism from wild rats. Although their blood was negative to microscopical examination, spirilla could be found without any difficulty in the blood of mice and guineapigs inoculated from them. The nature of the infection was studied in guineapigs and rabbits, especially the latter. The authors' results differ slightly from Mooser's [see this *Bulletin*, Vol. 23, p. 122] as regards the persistence of the spirilla in the inner organs and glands and the appearance of skin lesions, but the differences are only quantitative, not qualitative. The characteristic skin lesions with alopecia were only observed in albino rabbits. Immune bodies were found in the blood of rabbits, and the immunity of recovered animals is considered to depend on these antibodies, and not on a persistent infection. The central nervous system seems to have no affinity for the organism, for this part of the body was negative when other organs were positive.

E. Hindle.

Fischl (Viktor). Zur Kenntnis der experimentellen Sodoku. [**The Study of Experimental Sodoku.**]—*Ztschr. f. Hyg. u. Infektionskr.* 1929. Oct. 12. Vol. 110. No. 3. pp. 499–505. [15 refs.] [Psychiat-Neurol. Clinic, Univ., Heidelberg.]

The author studied a strain of *Spirillum minus* that was highly virulent for man, and in rats and mice produced typical infections, but was not pathogenic to guineapigs. In infected rats and mice the spirilla were common in the peripheral blood for 3 weeks after inoculation and afterwards became very scanty. Three gold preparations, solganal, solganal B, and lopion, were tested on these infections, but had no effect. Myosalvarsan in doses of 0·05 gm. was found to be very effective both for treatment and also as a prophylactic agent. Rats that had received an injection 3 weeks before inoculation of the spirillum still showed traces of protection, as evidenced by a lengthening of the incubation period.

E. H.

Ruys (A. Charlotte). Ueber *Spirillum minus*, dem Erreger der Rattenbisskrankheit. [**On** *Spirillum minus*, **the Causative Agent of Rat-Bite Fever.**]—*Seuchenbekämpfung.* Vienna. 1929. Vol. 6. No. 3. pp. 195–201. With 8 figs. [13 refs.] [Inst. of Trop. Hyg., & Hyg. Inst., Univ., Amsterdam.]

The author examined 100 rats in Amsterdam by Joekes' method which consists of inoculating a guineapig with skin from the rat under investigation, but only found this spirillum in one individual, which also showed them in its blood. Various animals were infected with this and three other strains, and the author gives a general account of the disease.

E. H.

AKAZAWA (S.). **Studies on the Drug-Fastness of Rat-Bite Fever Spirochete,** *Spirochaeta morsus-muris.* **I. Bismuth-Fastness.**—*Jl. Japan. Soc. Vet. Sci.* 1929. June. Vol. 8. No. 2. pp. 95–116. [25 refs.] [In Japanese. English summary pp. 117–118.] [Govt. Inst. for Vet. Research, Fusan, Japan.]

The author obtained a bismuth resistant strain of *Spirillum minus* by repeated injections of neotrepol (a bismuth preparation) into mice infected with rat-bite fever. This strain was then found to be resistant to the action of other bismuth compounds such as muthanol and casbis. The resistance was still present after 50 passages through mice during two years, and also after passage into a rat. When mice infected with this resistant strain are repeatedly treated with compounds not containing bismuth, the resistance occasionally disappears. Thus in mice the Bi-resistant strain seems to lose its peculiarity and return to normal after 10 injections of neosalvarsan (1 : 1,000), and silver salvarsan and Bayer 205 also had some effect. Trypaflavin and parafuchsin, on the other hand, did not alter the bismuth resistance of the strain. The resistant and normal strains gave similar infections in mice, rats and guineapigs. In splenectomized mice the resistant strain showed a slightly higher virulence than the normal strain. When the reticulo-endothelial system of mice was blocked with saccharated iron oxide or Indian ink, the animals were equally susceptible to both strains. The spirilla in these mice showed an increased tolerance to neosalvarsan. The resistant strain was found to be more sensitive to Bayer 205 and neosalvarsan, for in the case of the former drug the Bi-resistant strain was still sensitive to Bayer 205 after ten injections; whilst the normal strain became arsenic resistant after five injections. The Bi-resistant strain showed an increased resistance to the action of combined neotrepol and Bayer 205, but was more susceptible to the two drugs than the action of Bayer 205 itself. When parafuchsin, ethyl-violet or tryparosan was combined with 1 : 1,000 neosalvarsan, the resistant strain showed a higher susceptibility than the original strain.

E. H.

ROSE (Werner J.). **Report of a Case of Rat Bite Fever.**—*Bull. Buffalo General Hosp.* 1929. June. Vol. 7. No. 1. pp. 20–21. With 1 text fig. [4 refs.]

The record of a case of this disease in Buffalo, U.S.A., following the bite of a rat. The patient was cured by four injections of neoarsphenamine, in doses of 0·3 gm. to 0·9 gm. at 3 to 5 day intervals. Examination of the patient for *Spirillum minus* gave negative results, but a rat caught in the patient's home contained these organisms in both the heart blood and washings from the mouth and nose, as determined by inoculation into guineapigs.

E. H.

SMALLWOOD (R. P.). **Rat-Bite Fever from the Bite of a Pig.** [Memoranda.] —*Brit. Med. Jl.* 1929. June 29. p. 1159.

A record of a case of this disease, diagnosed entirely on clinical grounds, in a woman which developed after she had been bitten by a young pig. An injection of 0·6 gm. novarsenobenzene caused the fever to disappear, and the patient showed an uninterrupted recovery.

E. H.

Iyer (M. A. Krishna). **A Case of Rat-Bite Fever.**—*Indian Med. Gaz.* 1929. Oct. Vol. 64. No. 10. p. 571.

The record of a case of this disease, diagnosed clinically, in a patient at Madras, who was bitten by a bandicoot. After six months' illness, treatment with neosalvarsan was followed by complete recovery after 2–3 injections.

E. H.

Anguera (A.). El primer caso de sodoku en Guipuzcoa. [**The First recorded Case of Rat-Bite Fever in Guipuzcoa.**]—*Medicina Países Cálidos.* Madrid. 1929. July. Vol. 2. No. 4. pp. 359–360.

The record of a probable case of rat-bite fever, diagnosed on clinical grounds, which was cured by the use of neosalvarsan. The spirillum was not found.

E. H.

Campbell (Horace Emerson). Rat Bite Fever.—*China Med. Jl.* 1929. Sept. Vol. 43. No. 9. pp. 931–933.

UNDULANT FEVERS.

KRISTENSEN (Martin) & HOLM (Per.). Bakteriologische und statistische Untersuchungen über *Febris undulans* in Dänemark. [**Bacteriological and Statistical Study of Undulant Fever in Denmark.**]—*Zent. f. Bakt.* I. Abt. Orig. 1929. May 28. Vol. 112. No. 3/4. pp. 281–312. With 2 text figs. [30 refs.] [State Serum Inst., Copenhagen.] [Summary appears also in *Bulletin of Hygiene.*]

In a previous paper [this *Bulletin*, Vol. 26, p. 65] the author has recorded the bacteriological findings in 89 cases of undulant fever in Denmark, apparently due to infection with Bang's bacillus of bovine abortion (*Br. abortus*). In the present report he reviews a series of 500 cases, observed during the period April 1st 1927–December 1st 1928. The serum of each of these cases agglutinated a suspension of *Br. abortus* to a titre of 1 : 100, or higher. The bacillus was isolated from 23 cases : in 21 instances from the blood, once from an ovarian abscess, and once from the placenta in a case of human abortion. The inoculation of guineapigs with a considerable number of these human strains, and of other guineapigs with strains of *Br. abortus* derived from cattle, revealed no significant difference between the two series. There was no evidence that the human strains were more virulent than the bovine for these animals. Agglutination tests, including cross-absorption tests, revealed little if any difference between any of the human or bovine strains examined. A few tests with a *Br. melitensis* serum showed a sharp differentiation between the homologous strain and a bovine *Br. abortus* strain. Grown on liver agar, with the addition of methyl-violet or of thionin, the human strains resembled the bovine strains, in that they were completely, or very markedly, inhibited by thionin, but were little, or not at all, affected by methyl-violet. The two *melitensis* strains tested and a single porcine strain of *Br. abortus* were inhibited by methyl-violet, but not by thionin. All the Danish strains, whether of human or bovine origin, refused to grow, on first isolation, under ordinary aerobic conditions, without the addition of CO_2. Experiments on the lines of those recorded by MCALPINE and SLANETZ showed some divergence in glucose-utilization between the human and bovine strains on the one hand, and the porcine strains on the other. No clear-cut differences could be detected between the strains as regards H_2S production. The authors conclude that all the available evidence suggests that the human strains isolated in Denmark are identical with *Br. abortus* of bovine origin, but can be differentiated from *Br. melitensis* and from strains of *Br. abortus* of porcine origin.

Epidemiological and statistical studies, including details of the age, sex and occupation of the patients, and the topographical and chronological distribution of the cases, yielded results which lent support to the view that cattle formed an important source of infection, but they suggested that infection occurred, in the majority of cases, in other ways than through the consumption of milk or of milk products.

W. W. C. Topley.

DUFFAU. De l'utilisation du laboratoire dans le diagnostic de la fièvre ondulante. [**The Use of the Laboratory in the Diagnosis of Undulant Fever.**]—*Arch. Inst. Pasteur d'Algérie.* 1928. Dec. Vol. 6. No. 4. pp. 486–491. [Oran Hosp., Oran, Algeria.]

Undulant fever is endemic in Oran, and the author has made a particular study of the disease in recent years. The laboratory pro-

cedures which he employs for diagnosis are blood culture, agglutination reaction, and melitene reaction. Blood culture is the procedure of choice. There does not seem to be any particular period of the disease when the germ is more readily isolated from the blood than at others.

For example, out of 80 positive blood cultures—

30 were in the first 15 days.
15 in the 3rd and 4th week.
10 in the 2nd month.
3 in the 3rd month.
2 during the 6th month of the disease.

Two cc. of blood is usually sufficient in 20 cc. of ordinary peptone broth of a pH. of 7·1, that is, slightly on the alkaline side. This he considers is as good as any other culture medium. The blood should be well shaken up in the tube, and small sterile glass rods are used for defibrination. The growth begins to appear about the 2nd day.

For agglutination tests the selection of the strain is most important, and, as far as possible, it should be one which will be agglutinated by specific sera only, and not by heterologous. Three strains are employed for each test. Any titre over 1/30 is taken as diagnostic.

For the intradermal test the author employs an emulsion of the three test strains. He injects 1/10 cc. of melitene into one arm and 1/10 cc. of the killed emulsion into the other. The reaction was positive in all the cases which gave a positive blood culture, but a modified result was obtained in eight cases of typhoid and in two normal people.

D. Harvey.

Favilli (Giovanni). Osservazioni sopra una epidemia di febbre ondulante nella provincia di Firenze. [**On an Outbreak of Undulant Fever in the Province of Florence.**]—*Sperimentale.* 1929. Vol. 83. No. 5. pp. 515–525. [9 refs.] [Inst. General Path., Univ., Florence.]

In Barberino di Mugello, a market-town some 30 kilometres from Florence, an outbreak of undulant fever occurred last spring involving 35 persons. There were no goats in the district, nor any cases of contagious abortion among the cattle, but many of a flock of sheep had aborted. The owner of the flock made and sold cheese. Although infection of the cows could not be absolutely excluded, the source of this outbreak is believed to have been the disease in the sheep. The organism isolated from human cases did not possess the characteristics of *Br. abortus* but those of *Br. paramelitensis.*

H. Harold Scott.

Vercellana (G.). Sul potere patogeno per l'uomo e per la scimmia dei batteri di Bruce e di Bang. [**The Pathogenicity of** *Brucella melitensis* **and** *Br. abortus* **for Man and Monkey.**]—*Giorn. di Clin. Med.* 1929. July 20. Vol. 10. No. 10. pp. 634–636, 639–642, 645. With 2 charts. [Inst. of General Path. & Bact., Univ., Parma.]

——. Expériences sur le pouvoir pathogénique pour les singes du bact. de Bang provenant de chèvres, et du bact. de Bruce provenant de vaches.—*Bol. Sezione Ital., Soc. Internaz. di Microbiologia.* Milan. 1929. Aug. Vol. 1. No. 8. pp. 175–177. [Inst. of General Path. & Bact., Univ., Parma.]

The author injected intravenously into two *Macacus sinicus* 10 million *Br. melitensis* (Langhirano strain obtained from a human

case) after passage through a cow. Typical attacks of undulant fever ensued, of which the charts are given, thus showing that *Br. melitensis* of human origin does not lose its virulence for a susceptible animal by being passed through cattle. Next he injected intravenously into each of two more monkeys (*M. sinicus*) 10,000 million *Br. abortus* isolated from cows and subsequently passed through a goat. A slight rise of temperature resulted, which is ascribed to heterogeneous protein. Repeated haemocultures were negative, although the serum agglutinated in a titre of 1 : 400. The conclusions drawn from these experiments are : (1) That *Br. abortus*, after passage through the goat, does not acquire increased virulence for the monkey ; (2) That *Br. melitensis*, after passage through the cow, does not suffer any loss of virulence for the same animal (*M. sinicus*). The crucial test of substituting man for the monkey has not been tried, but, by analogy, the question of the pathogenicity of Bang's bacillus for man, the author maintains, is still unproved.

H. Harold Scott.

Albiston (Harold E.). **The Occurrence of *Brucella abortus* (Bang) in Market Milk and its Relation to Disease in Man.**—*Med. Jl. Australia.* 1929. June 29. 16th Year. Vol. 1. No. 26. pp. 863–864. [4 refs.] [Vet. Research Inst., Univ., Melbourne.]

During the last two years an investigation has been in progress at the Veterinary Research Institute, University of Melbourne, to determine the prevalence of tubercle bacilli in the metropolitan milk supply in the city. This work included the examination of milk from nearly 1,300 dairy farms, and the presence or otherwise of tubercle bacilli was judged by the effect on guineapigs inoculated with the milk.

It was noted that a certain percentage of the guineapigs showed at autopsy a pathological condition resembling tuberculosis in its macroscopical appearances. This condition, characterized by lymphadenitis and enlarged spleen, was found on further investigation to be due to *Br. abortus*. At the conclusion of the investigation it was found that 24·5 per cent. of the farms were supplying milk containing *Br. abortus*.

As infection of man with *Br. melitensis* is not known to occur in the state of Victoria, the author considers that much light might be thrown on infection of man with *Br. abortus* if a careful lookout was kept for cases. He suggests, therefore, that all sera sent to laboratories for the Widal reaction in cases of fever should also be tested for agglutinins for *Br. abortus*, and, if these should be found, attempts should be made to isolate the organism and to identify it.

D. H.

Baker, Jr. (B. M.). **Undulant Fever presenting the Clinical Syndrome of Intermittent Hydrarthrosis.**—*Arch. Intern. Med.* 1929. July. Vol. 44. No. 1. pp. 128–141. With 6 figs. [31 refs.] [Med. Clinic, Johns Hopkins Univ. & Hosp., Baltimore.]

This is a report of an interesting case of infection with *Br. abortus* in a man aged 47.

The first symptom noted by the patient was swelling of the right knee ; this swelling began to disappear after two days, when the left knee commenced to swell. This process of intermittent and alternate swelling of the knee joints continued regularly for nearly seven months, and was accom-

panied by irregular fever. Thick fluid was drawn off from the knee joints on several occasions and *Br. abortus* was cultivated therefrom and the same organism was obtained by blood culture.

An autogenous vaccine was given, the fever ceased and the swelling of the knees also stopped. Similar cases of intermittent hydrarthrosis have been described before, but no cause has ever been discovered ; the author suggests that some, at least, of these cases may have been *Brucella* infections and urges that, if further cases should be met with, careful bacteriological investigations should be carried out.

D. H.

Hoffman (Arthur M.). **Treatment of Undulant Fever with Acriflavine.** —*Jl. Amer. Med. Assoc.* 1929. June 29. Vol. 92. No. 26. pp. 2169–2171. With 3 charts in text. [14 refs.]

The author points out that up to the present there is no drug which can be said to be a specific for the treatment of undulant fever ; the treatment is symptomatic. Vaccine treatment has given good results in some cases but in others has been of little avail.

Italian physicians have reported good results from the use of acriflavine intravenously in doses of 0·01 gm. per kilo. of body weight. The author attempted acriflavine therapy in two cases of undulant fever and the success following on these attempts prompts this publication. Both cases were typical of undulant fever and, although blood culture was not positive, the agglutination reaction with *Br. abortus* was diagnostic. In both cases the fever commenced to fall by lysis after the first intravenous injection and reached normal seven or eight days later. The only criticism is that the treatment was not commenced until the fever had lasted over six weeks in one case and two months in the other. That this criticism is valid is indicated by the fact that in a third case, which was not treated by acriflavine, the fever was of shorter duration than in the two treated cases. At the same time the author is convinced that the drug had a favourable influence on the course of the disease and urges its use in further cases.

D. H.

Vegni (Remo). Ricerche sulla chemioterapia dell'infezione Maltese. (II Nota). [**Studies in the Chemotherapy of Undulant Fever.**]— *Giorn. di Batteriol. e Immunol.* 1929. Apr. Vol. 4. No. 4. pp. 293–306. [17 refs.]

In order to study the effects of rivanol the author first put up a series of tests to determine its bactericidal effect on *Br. melitensis* in vitro, and found that a strength of 1 in 250,000 in water sufficed to kill the organisms after 14 hours' contact. The use of glucose broth greatly lowered the bactericidal effect, growth occurring in dilutions higher than 1 in 20,000 ; with addition of 20 per cent. agglutinating human serum, the zone of inhibition occurred at 1 in 50,000.

Application of the drug was then made to undulant fever patients ; 25–50 cc. of a 0·1 per cent. solution of rivanol in freshly distilled water were injected intravenously. The effects were to reduce the temperature somewhat and to produce a feeling of improvement, but these results

were only transient. It may be that the reduction of the bactericidal effects on contact with human serum, as shown by experiment, will set a definite limit to the therapeutic use of rivanol.

H. Harold Scott.

Amoss (Harold L.) & Poston (Mary A.). **Undulant (Malta) Fever. Isolation of the Brucella Organism from the Stools.**—*Jl. Amer. Med. Assoc.* 1929. July 20. Vol. 93. No. 3. pp. 170–171. [8 refs.] [Med. Clinic, Johns Hopkins Univ. & Hosp., Baltimore.] [Summary appears also in *Bulletin of Hygiene.*]

Employing the method of preliminary flocculation with a specific agglutinating serum, the authors have succeeded in isolating strains of *Brucella* from the faeces of two cases of undulant fever. In one case the strain isolated was of the *melitensis* type, in the other it showed the characters of the porcine variety of *Br. abortus.*

The technique adopted was as follows. About 1 gm. of fresh faeces was suspended in 50 cc. of sterile saline and shaken for a few minutes. The suspension was filtered through four layers of gauze and then centrifuged at half speed for three minutes. To the supernatant suspension an agglutinating serum was added, in such an amount as to give a final dilution of 1 : 100. The mixture was incubated for 2 hours at 37° C. ; it was then centrifuged at half speed for 5 minutes, and the supernatant fluid discarded. The deposit was resuspended in saline, well mixed, and centrifuged again. This procedure was twice repeated. Finally the precipitate was spread with a bent glass rod on eosine-methylene-blue plates, some of which were incubated at 37°C. aerobically, and others in an anaerobic jar containing 10 per cent. CO_2.

W. W. C. Topley.

Dechigi-Declich (Melchiorre) & Favia (Nicola). Tentativi di immunizzazione coll' antivirus alla Besredka nella febbre ondulante. [**Attempts at Immunization against Undulant Fever by Means of Besredka's Anti-Virus.**]—*Giorn. Batteriol. e Immunol.* 1929. May. Vol. 4. No. 5. pp. 401–413. [7 refs.] [Hygiene Inst., Univ., Florence.]

The authors' experiments were directed to two ends. First, to determine whether there was any anti-virus present in the filtrate of a broth culture of Brucella ; secondly, if the result was positive, to test its capability of conferring immunity to infection.

Having obtained a filtrate and placed some of it in each of two tubes, they sowed Brucella (both *melitensis* and *abortus*, which had been employed in obtaining the original growth) in one and staphylococci in the other, controlling by inoculation of a tube of nutrient broth with the former. The staphylococcus and the control tubes both gave a growth, the other remained clear, showing that the filtrate had inhibited growth.

For animal experiment they used rats, in whom the disease runs a rapid course, as well as guineapigs and rabbits. They found that after injection with the anti-virus the animals did not systematically behave differently from controls without it, and consequently they

could not confirm any efficacious immunity from its use. On the other hand, judging from a leucocytosis which always followed injection of the filtrate in rabbits, the anti-virus is believed to lead to a certain stimulating effect on the defensive powers in this animal.

H. Harold Scott.

Zanzucchi (A.). Immunizzazione preventiva della vacche con bacilli di Bang vivi e virulenti contro l'aborto epizootico ed epidemiologia della febbre ondulante. [**Prophylactic Immunization of Cows against Epizootic Abortion with Living and Virulent *Br. abortus* and the Epidemiology of Undulant Fever.**]—*Giorn. di Clin. Med.* 1929. July 20. Vol. 10. No. 10. pp. 629–630, 633. [Inst. of General Path. & Bact., Univ., Parma.]

As a preventive of epizootic abortion vaccination with living and virulent cultures of Bang's bacillus has been commonly practised in recent times. The author used freshly isolated strains from cows in Parma and Reggio Emilia ; he grew them on 2 per cent. glucose agar for 48 hours at 37° C., and made an emulsion in 1 per cent. salt solution, putting up the product in vials of 10 and 20 cc., containing 100 million organisms per cc. For immunization the contents of the vials were injected in two doses at an interval of 15 days into the subcutaneous tissue of the caudal fold or behind the scapula. 2,500 cows were thus inoculated, and by examination of milk and urine during a period of four months after the second injection he proved that virulent bacilli were being excreted. He also kept under observation 3,800 individuals engaged on the farms or drinking the milk of these cows. The records of notified diseases showed that in these two districts the number of cases in Parma of undulant fever in a period [length not stated] prior to the injection was three, and the same subsequent to the vaccination ; in Reggiano the number was six in each period ; in other words, there was no increase in the cases recorded. Had the bacillus been *Br. melitensis* there would have been a widespread epidemic. The inference is that *Br. abortus* is non-infective, at least non-pathogenic, for man.

H. Harold Scott.

Ascoli (M.) & Sanfilippo (E.). **Vaccination of the Goat against *Micrococcus melitensis* Infection.**—*Jl. Trop. Med. & Hyg.* 1929. Oct. 15. Vol. 32. No. 20. pp. 289–290. [10 refs.] [Med. Clinic, R. Univ., Catania.]

This is a summary of the work of these authors on the immunization of goats against *Brucella melitensis* infection. The original papers were noticed in this *Bulletin* [Vol. 26, pp. 445 and 830]. Their conclusions are that a clear immunity may be established in goats against *Br. melitensis* infection by massive injection of at least 12 to 16 platefuls of killed culture on two occasions with an interval of eight days. They are continuing their observations and hope to be able to show that kids 3 to 4 months old can be protected, by vaccination, from infection, even after pregnancy and subsequent lactation.

D. H.

CANTANI (F.). Contribution expérimentale à la différentiation du micrococcus mélitensis et du bacille de Bang. [**Differentiation of** *Br. melitensis* **and** *abortus*.]—*Bol. Sezione Ital., Soc. Internaz. di Microbiologia.* Milan. 1929. Aug. Vol. 1. No. 8. pp. 194–195.

——. Sulla differenziazione del micrococco melitense e del bacillo di Bang. Nota preventiva. *Giorn. di Clin. Med.* 1929. Sept. 20. Vol. 10. No. 13. pp. 827–828. [Summary appears also in *Bulletin of Hygiene.*]

By earlier experiments the author considered that he had established a marked difference between *Br. melitensis* and *Br. abortus* as regards pathogenicity for rabbits.

He has carried out further research, injecting intracranially, after trephining, emulsions of 48-hour agar cultures of four strains of *Br. melitensis* and five of *Br. abortus*. He was unable to confirm his former conclusions; differences practically as great were noticed between the results of various strains of the same organism as had been seen previously between the two bacilli. Guineapigs were found to react in a similar way. So far, therefore, pathogenicity for laboratory animals has not revealed a means of distinguishing these organisms from one another.

H. Harold Scott.

BIANCHINI (Antonio). Il comportamento delle Brucelle abortus e melitensis di fronte ad alcuni prodotti chemioterapici in vitro.—*Nuova Vet* 1929. Oct. 15. Vol. 7. No. 10. pp. 10–12. [Inst. of Vet. Med., Turin.]

VEGNI (Remo). Ricerche sperimentali di differenzazione del micrococco di Bruce dal bacillus abortus di Bang.—*Giorn. Batteriol. e Immunol.* 1929. May. Vol. 4. No. 5. pp. 448–456. [77 refs.]

DENGUE AND PAPPATACI FEVER.

Russian Journal of Tropical Medicine. 1929. Vol. 7. No. 3. pp. 201–202. Conférence de la dengue. [**Conference on Dengue.**]

Conference on dengue held at Moscow on 5th and 6th March, 1929. The following conclusions were arrived at :—

The fact that the *Aëdes aegypti* is widely spread in the Soviet Republics constitutes a menace of the introduction of dengue into the country. This being admitted, the following measures should be taken.

(*a*) A special Commission should be appointed, composed of representatives of the various scientific bodies, including the Institutes of Tropical Medicine, with power to co-opt to their numbers. The Commission should meet monthly.

(*b*) The Institutes of Tropical Medicine and Anti-Malarial Stations should organize a rigorous search to define the limits of the habitat of Aëdes mosquitoes and study their biology with a view to taking measures to destroy them.

(*c*) On a line of the shores of the Black Sea to the south of the 43rd parallel active measures should be taken to destroy this mosquito ; north of this a study of the distribution is sufficient.

(*d*) The various Institutes are each given an area of territory for which they are responsible.

D. Harvey.

Public Health Reports. 1929. Aug. 30. Vol. 44. No. 35. pp. 2106–2107.—**Plan for International Agreement regarding Dengue.**

A plan for international agreement regarding dengue was approved at the Session of the Permanent Committee of the International Office of Public Hygiene held in May of this year.

" 1. When dengue shall appear in epidemic form in one of the countries participating in the present agreement, the highest health authority of the country shall notify the other participating countries.

" It shall keep the International Office of Public Hygiene informed as to the movement of the epidemic.

" 2. When an epidemic of dengue is reported in a port or in the region near a port, the sanitary authority of said port shall recommend to the captains, and eventually to the ship's doctors, the carrying out, as soon a possible after leaving the port, of a search for and destruction of mosquitoes and their larvae in all accessible parts of the ship, especially in the cabins, baggage rooms, stewards' rooms, kitchens, heating apparatus, water tanks, and all places especially likely to give shelter to mosquitoes.

" It shall urge the physician, or, in the absence of a physician, the captain, to take the necessary precautions so that, if cases of dengue occur on board, the patients can be isolated in places where they cannot be bitten by mosquitoes.

" 3. Every ship coming from a port where an epidemic of dengue is in progress and arriving in a port where where the sanitary authority has reason to fear that the disease may be spread, by reason of the presence of a large number of mosquitoes which are likely to transmit it, may be subjected to the following measures :

" (*a*). Interrogation, and reply by the physician, or, in his absence, by the captain, to the question : ' Are there, or have there been, on board persons suffering from dengue? '

" (*b*). Medical inspection.

" Patients suffering from dengue for less than five days who desire to leave the ship will be taken off immediately, and isolated on land, following instructions from competent sanitary authorities, in places where they will be protected from mosquito bites, until the expiration of five days from the onset of the disease.

" (*c*). Inspection of the ship with a view to ascertaining that no *Stegomyia* [*Aëdes*] exist, with the reservation that measures taken en route will be considered. In the case that the presence of *Stegomyia* [*Aëdes*] has been reported on board, the sanitary authority of the port shall carry out the destruction of the mosquitoes.

" (*d*). By exception, the sanitary authority of the port may, if he considers it necessary by reason of circumstances, place the disembarked passengers under surveillance, and confine the baggage on board until the expiration of eight days after exposure to risk."

D. H.

Boyé. Une épidémie de dengue en Cochinchine, en 1927. [**Dengue Epidemic in Cochin China in 1927.**]—*Bull. Office Internat. d'Hyg. Publique.* 1929. Sept. Vol. 21. No. 9. pp. 1546–1548.

There had been only sporadic cases of dengue in this district for some years, but in May, 1927, several cases appeared. The disease spread with great rapidity and within a few weeks there were thousands of cases. In the following season only a few cases occurred, and those in persons who had been attacked in the previous year.

The author is unable to explain this sudden outbreak. Stegomyia mosquitoes are common in the area, but they were no more numerous in 1927 than in 1926 or in 1928. It was noted that the use of the mosquito net was not so efficient a safeguard against this disease as it is against malaria, and that cases were not more numerous in the country where mosquitoes are plentiful than in the towns where they are few. The author is of opinion that these findings are not in keeping with the theory that the mosquito is the one and only transmitter of infection. Clinically the disease was typical and the mortality nil.

It was noted that people who were under treatment for syphilis with novarsenol-benzol, or amoebic dysentery with stovarsol, readily contracted dengue.

D. H.

Garin (Ch.). La dengue. [**Dengue.**]—*Rev. Prat. Malad. des Pays Chauds.* 1928. Oct. Year 7. Vol. 8. No. 10. pp. 505–508.
Cleland (J. Barton). **Dengue Fever in Australia.**—*Ibid.* pp. 509–514. [6 refs.]

i. A résumé of recent knowledge of dengue, in view of the epidemics in Greece and elsewhere. The author refers to the work of Couvy on the spirochaetes and describes these parasites, but adds, " nevertheless further research is necessary to put the nature of the virus of dengue beyond a doubt." The symptomatology, diagnosis, etc., are fully discussed.

ii. Dengue was first noted as epidemic in Queensland in 1885, and later epidemics occurred in 1891–97–98, 1904–05–16–17–25 and 1926. The disease remained true to type and was and is still classical dengue fever. Australia, being free from other dengue-like diseases, is therefore

suitable for the elucidation of the etiology. BANCROFT in 1906 noted that persons who visited Brisbane and only stayed there during the day contracted dengue, and he concluded that a day-biting insect must convey the disease, and this suggested Stegomyia rather than Culex. He experimented with this mosquito and one person bitten developed dengue twelve days after, but the possibility of natural infection could not be excluded.

Dengue is not naturally contracted south of Newcastle, N.S.W., yet Culex is spread all over the continent; whereas Stegomyia is limited to the same areas as dengue.

The author and his co-workers in 1916 collected Aëdes mosquitoes in Brisbane and conveyed them to Sydney and there fed them on volunteers and they developed the disease in an area where dengue was unknown. Similar experiments with Culex were unsuccessful. The incubation period in these cases was from five to ten days. Blood serum was shown to be infective and also filtered serum. Infective blood kept in the cool, infected after seven days. Repeated passage by inoculation from man to man produced no change in the nature of the disease.

D. H.

JORGE (Ricardo). La dengue. A propos d'une épidémie nautique dépistée à Lisbonne. [**An Account of a Ship Outbreak of Dengue diagnosed at Lisbon.**]—*Bull. Office Internat. d'Hyg. Publique.* 1929. Sept. Vol. 21. No. 9. pp. 1531–1545. [18 refs.]

There had been no dengue in Portugal until the arrival of the Danish cargo steamer "Thyra" in the harbour of Lisbon. This steamer reached Dakar (West Africa) on September 3rd, 1928, stayed there for six days, made a trip to some other local ports, returned to Dakar for two days, and sailed for Copenhagen on September 22nd. When off Lisbon the captain was compelled to discontinue his voyage as the entire crew, with two exceptions, were incapacitated by illness; the ship anchored in the harbour of Lisbon on October 3rd. The crew numbered 15 and there was one passenger; only this passenger and 2 of the crew were not ill. The first case, the cook, occurred on September 26th, the fourth day of the voyage, and the last case occurred on October 2nd, the tenth day of the voyage; the ship arrived at Lisbon next day.

The cases were at once diagnosed dengue; clinically they were of classical type. It was obvious that the infection had taken place in Dakar, where dengue is endemic. The author cites several instances where ships calling at that port have had many cases of dengue on board.

A very careful examination of the "Thyra" was made by Port Health Authorities, but only a few *Culex fatigans* mosquitoes could be found on board and no *Aëdes*: the author therefore considers that the infection took place on shore at Dakar.

There follows a discussion of the relation between dengue and sandfly fever. The author takes the orthodox view that these two diseases are distinct; he also agrees that dengue, yellow fever and Weil's disease are clinically, epidemiologically and etiologically different.

D. H.

LEGENDRE (J.). Au sujet de la pathogénie de la dengue. [**The Pathogeny of Dengue.**]—*Bull. Soc. Path. Exot.* 1929. June 12. Vol. 22. No. 6. pp. 419–423. [1 ref.]

This is a criticism of the paper of CARDAMATIS (see this *Bulletin*, Vol. 26, p. 833) in which he asserts that three-day fever, and dengue (*Aëdes*) are due to one and the same cause.

Legendre considers, and most will agree with him, that the above statement cannot stand in view of known facts, some of which he proceeds to tabulate as follows :—

(1) Dengue (malady carried by Aëdes) occurs in countries where sandflies are unknown.

(2) Three-day fever exists where Aëdes is not to be found.

(3) In countries where both insects occur the diseases co-exist.

Clinically the two diseases can be readily differentiated. It is well known that in certain countries where Aëdes alone is found mild cases of dengue are seen, without rash and with a fever of three days' duration : and in other areas where there is only Phlebotomus you find quite severe cases of sandfly fever lasting five to six days.

In the discussion, CAZANOVE was inclined rather to favour the opinion of CARDAMATIS. He had seen typical dengue in districts where Stegomyia was non-existent and sandflies numerous, and typical three-day fever in districts where Stegomyia was the only pest. He was of opinion that sandfly fever, dengue and yellow fever were very closely allied, and that although typical cases could be definitely diagnosed, yet there were anomalous cases of all three which it was impossible to place correctly. He concluded by saying that the case should be taken as not proven until some definite bacteriological or serological test was devised which permitted one clearly to differentiate between sandfly fever and dengue.

D. H.

STEFANOPOULO (G.). Sur les rapports étiologiques de la dengue et de la fièvre jaune. [**The Etiological Relations of Dengue and Yellow Fever.**]—*Bull. Soc. Path. Exot.* 1929. July 10. Vol. 22. No. 7. pp. 538–540. [6 refs.]

BLANC and his collaborators showed that the anti-yellow fever serum of the Pasteur Institute was without action on the virus of dengue [this *Bulletin*, Vol. 26, p. 839]. The author of the present paper carried out some experiments which show that the serum of dengue convalescents is without action on the yellow fever virus.

Thus a macacus monkey received a mixture of a fatal dose of yellow fever virus (emulsion of liver) and 2 cc. of the serum of a patient convalescent from dengue ; six days later the animal died of typical yellow fever, and the liver served to carry on the virus to other monkeys. Two monkeys were infected with dengue virus (blood of patient) ; one was bled 17 days later and its serum, mixed with a fatal dose of yellow fever virus, was inoculated into a third monkey ; this monkey died of yellow fever four days later. The second monkey eleven days after receiving the dose of dengue virus was inoculated with a fatal dose of yellow fever virus and died five days later.

The above experiments confirm the work of BLANC and show that, from the point of view of immunology, dengue fever and yellow fever are separate and distinct diseases.

D. H.

Photakis (B. A.). Die klinischen Äusserungen des "Denguefiebers" im Lichte der Obduktionsbefunde. [**The Clinical Signs of Dengue in the Light of the Post-mortem Findings.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1929. June. Vol. 33. No. 6. pp. 333–335. [Pasteur Inst., Athens.]

The spleen was not enlarged and no histological changes could be found. The liver, on the other hand, was usually enlarged and this enlargement was due to a hyperaemia. In cases which had showed during life bradycardia some degenerative changes were found in the heart muscle. The muscle weakness and myalgia of the striped muscle is evidence also of a like change of this structure.

The author considers that these four points in the post-mortem of dengue are specific and distinguish the disease readily from other acute fevers.

In some cases which had shown evidence of nephritis during life no change could be found in the kidneys. It is considered that the haematuria is part of the general haemorrhagic condition and not due to an inflammation of the kidneys. Although the slow pulse and other symptoms are attributed to suprarenal insufficiency, no changes were found in these organs.

D. H.

Manuélidis. Dengue (complications de l'épidémie d'Athènes). [**Complications of Dengue.**]—*Rev. Prat. Malad. des Pays Chauds.* 1929. Jan. Year 8. Vol. 9. No. 1. pp. 666–668, 671–674.

In view of the fact that there were over one million cases of dengue in Greece among a mixed population, where malaria, etc., is rife, the author remarks that it is not surprising that nearly all the possible complications of an infectious malady were met with. But he deals in this paper with the complications peculiar to dengue which concern principally the nervous and circulatory systems. The virus of dengue is peculiarly neurotropic, as evidenced by the pains in the back and limbs and the effects on the sympathetic system. A condition of meningo-encephalitis has also been observed and various monoplegias and hemiplegias and peripheral neuritis. As regards the circulatory system the heart, as a rule, retains its functions unimpaired, but arteritis and phlebitis have been noted. An interesting point is the fragility of the capillaries with resulting haemorrhages in and from various organs, such as, notably, the kidneys.

D. H.

Dracoulidès (N.). Observations dermatologiques au cours de la dengue (pendant la pandémie d'Athènes, en 1928). [**The Dermatology of Dengue.**]—*Bull. Soc. Française Dermat. et Syph.* 1929. June. No. 6. pp. 612–615. [2 refs.]

In view of the large number of cases of dengue in Greece in 1928, the author describes the symptoms, complications and sequelae affecting the skin, which he met with in the course of his practice as dermatologist. Apart from the specific dengue eruption, the following were seen :—

1. *Purpura* :—Two cases ; both during convalescence, one in an old man of 73 ; this was a generalized purpuric eruption, without fever, but suggesting an infection purpura. Cured by administration of lime salts.

2. *Sudamina.*—Pinhead spots containing a crystalline fluid and appearing in successive crops ; no fever and no itching ; the attack lasted about 15 days and was followed by brawny desquamation. The most marked case was in a lad who suffered from abscesses following dengue.

3. *Pustular eruptions and infections of the skin.*—There were many such cases : these comprised boils, carbuncles, follicular pustular eruptions, etc.

The author is in agreement with KYRIASIDES, in the opinion that dengue produces a state of lowered resistance to infections.

Treatment.—Stock and autogenous vaccines were of little use, but Besredka's local vaccine treatment was used with success.

Alopecia was fairly common, especially among women after an attack of dengue ; lotions were useful, but the best results were obtained from application of ultra-violet rays.

D. H.

KOKORIS (D.). Chirurgische Beobachtungen beim Denguefieber. [**Surgical Observations in Dengue.**]—*Wien. Klin. Woch.* 1929. June 6. Vol. 42. No. 23. pp. 781–782.

The author discusses the surgical aspects of the dengue epidemic in Greece in 1928. He is of opinion that dengue predisposes to inflammation and pyogenic infections such as boils and carbuncles, many of which require surgical treatment. He noted that on occasions when subcutaneous injections were given, inflammation followed, although every antiseptic precaution was taken. Suppuration of the urinary tract was also noted, with occasionally acute retention of the urine. Cystitis occurred in women and the colon bacillus was isolated from the urine. Appendicitis and cholecystitis were found to be more frequent in dengue patients than in others ; such cases were not easy to diagnose. The author cites a case where a woman, aged 70, the subject of dengue, developed a purulent discharge from the vagina, and another case of a man who had a small neoplasm in the axilla, after dengue, which suddenly began to enlarge rapidly.

KONDOLEON (Emm.) & JOANNIDES (G.). Die chirurgischen Komplikationen der Dengue. [**Surgical Complications of Dengue.**]—*Muench. Med. Woch.* 1929. Feb. 1. Vol. 76. No. 5. pp. 197–198. [Greek Pasteur Inst., Athens.]

This paper, like those of KYRIASIDIS (below), refers to the frequency of inflammatory and suppurative lesions following attacks of dengue. Ten cases of inflammation of the parotid gland were met with ; two healed without suppuration and two were bilateral. The prognosis in these cases, even when early incision was carried out, was grave. In 60 cases, in the clinic, there were many cases of carbuncle and staphylococcal abscesses. Inflammation of the fascia of the palms of the hands was seen ; also one or two cases of circumscribed peritonitis, which were operated on. One case of retention of urine was due to inflammation in the pelvic region. The author agrees with KYRIASIDIS that there is distinct evidence, both in the local condition in the tissues and in the blood picture, that the virus of dengue causes marked diminution of protective power, and on this account he warns physicians against the use of hypodermic medication in dengue.

D. H.

Kaïris (Z.). Ueber die chirurgisch-urologischen Komplikationen des Denguefiebers. [**Surgical Urological Complications in Dengue.**]—*Ztschr. f. Urol. Chirurg.* 1929. July 9. Vol. 27. No. 4–6. pp. 419–423. [1 ref.]

The author gives an account of the dengue epidemic in Athens in 1927, and points out that there were many variations from the normal type, and, indeed, the clinical picture was protean. Some authors have stated that albumin is not present as a rule in the urine of dengue fever patients, but this was not the experience of the author.

The purpose of the paper is to draw attention to some cases in the author's practice in which various urological complications occurred. In the majority such complications were reactivations of latent infections. Thus in three patients who had been previously operated on for vesico-vaginal fistula, and in whom the urine had cleared up, pus again appeared in the urine during the attack of dengue. In one case, a man of 45 years of age, pus appeared in his urine with symptoms of cystitis ; on examination a previously unsuspected stone in the right kidney was discovered. Another case, that of a man who had been operated on for stone in the bladder some years previously, developed during his attack of dengue an acute cystitis, which soon cleared up under treatment. Although in most of his cases of pus in the urine, *Bact. coli* or staphylococcal infections were found, the suggestion is made that the virus of dengue may be capable of pus production apart from its effect in reducing bodily resistance.

A case of acute retention of urine was attributed to the influence of the virus on the nerve supply to the wall of the bladder.

D. H.

Kyriasidis (K. N.). Untersuchungen ueber die Aetiologie der infektiösen Prozesse bei Denguefieber. [**Etiology of the Inflammatory Complications of Dengue.**]—*Deut. Med. Woch.* 1929. Sept. 27. Vol. 55. No. 39. pp. 1634–1635. [6 refs.]

Kyriazides (N.). Recherches de laboratoire sur l'étiologie des complications inflammatiores de la dengue.—*Presse Méd.* 1929. Sept. 21. Vol. 37. No. 76. pp. 1233–1235. [6 refs.]

The principal inflammatory complications noted in dengue cases were boils, carbuncles, inflamed glands (parotid and lymph), abscesses at the site of subcutaneous injections, septicaemia, acute appendicitis and reactivation of old sores.

Seven cases with complications were specially investigated and the results are displayed in tabular form : Three showed boils or carbuncles one going on to septicaemia and death. Two developed abscess at the site of an injection and both died, one from streptococcal, the other from staphylococcal infection. One developed a deep-seated inflammation in the palm of the hand ; this was treated by autogenous vaccine and made a good recovery. One developed inflammation of the parotid gland and died. The author is of opinion that the virus of dengue renders the patient specially susceptible to inflammatory attacks owing to a reduction in protective power.

Blood counts of 80 cases are tabulated ; there was reduction in the total number of red cells but not below 3,500,000 ; the haemoglobin varied from 60 to 90 per cent. The white cells were reduced in number and this reduction persisted for 20 days after the fever, counts as low

as 2,000 per cmm. being met with. This white cell loss was principally due to reduction in the polymorphonuclear cells ; there was a relative lymphocytosis.

A bacteriological investigation of the seven cases showed that in five *Staphylococcus aureus* was responsible and in two the streptococcus ; there were four deaths and three recoveries. The opsonic index tested in 33 cases was found to be below the normal for staphylococcus in 32.

D. H.

Oekonomopoulo (N.). Die Dengue-Fieber-Erkrankung in Beziehung zur Lungentuberkulose. [**Dengue and its Relation to Tubercle of the Lung.**]—*Acta Med. Scandinavica.* 1929. July 2. Vol. 71. No. 3/4. pp. 301–324. With 30 text figs.

This long paper is largely taken up with detailed descriptions of cases and their investigation by bacteriological, clinical and X-ray examinations ; no fewer than thirty radiograms of the chest are reproduced. It is on the same lines as that by Chaniotis and Scordombekis summarized in this *Bulletin* [Vol. 26, p. 836].

Category I of the present author (50 cases) includes people who had showed no symptoms of definite tuberculosis of the lung prior to the attack and who, during and for some months after the illness, were under his personal supervision.

Category II persons who some time after the attack of dengue attended for various ailments, such as increased expectoration, slight evening rise of temperature, difficulty in breathing, etc. These persons, 38 in number, attended for the first time and so far as they knew had never suffered from tuberculosis.

All these 88 cases were very carefully examined, and in none of Category I was any sign of tuberculosis found and in only two out of Category II. These two were considered to be the development of a latent tendency to tubercle which had been ignored by the persons themselves and overlooked by their medical attendants.

In certain cases X-rays showed some old lesions, but there was no evidence whatever of reactivation. The author therefore considers that one must be very guarded in attributing any phthisogenetic influence in the strict sense to dengue, and if any such power really exists, it is in a very much smaller ratio than in influenza.

Part II deals with cases in which tubercle of the lung, in one form or another, was present. The cases here described were already in the tubercle clinic and under treatment and developed dengue while under observation. These cases are divided into :—

A.	Progressive form of tubercle	7 cases.
B.	Stationary form of tubercle	7 cases.
C.	Latent (inclined to) tubercle	11 cases.

Part III deals with the influence of dengue on definitely latent and clinically cured cases. Nine are described in detail and the following summing up of the two last categories is given.

Dengue fever is of such short duration that even in its most severe form it exercises but a passing influence on the different organs ; it is thus exceedingly unlikely that it could produce any lasting change.

On the other hand, the author considers, the haemorrhagic diathesis so noticeable in the dengue epidemic in Athens may have a considerable bearing on the lung condition ; and if a tuberculous lesion is present—especially if it is in the early stage and in the exudative condition without any fibrotic change—an attack of dengue may have an unfavourable influence. If, however, the tuberculous process is chronic and the fibrotic stage has been reached dengue cannot and does not exert any influence whatsoever.

D. H.

Blanc (Georges) & Caminopetros (J.). Contribution à l'étude de la vaccination contre la dengue. [**Vaccination against Dengue.**]—*Bull. Acad. Méd.* 1929. July 9. Year 93. 3rd Ser. Vol. 102. No. 26. pp. 37–40. [9 refs.] [Pasteur Inst., Athens.]

In view of the recent widespread epidemics of dengue it would be well to consider the possibility of anti-dengue vaccination. In September, 1928, the authors carried out an enquiry into this question: they considered (1) immunity following an attack, (2) immunity following injection of killed virus and serum of convalescents.

Opinions differ as to the occurrence of second attacks of dengue, but observers in Athens, including the authors, were of opinion that second attacks were very rare and that one attack conferred a very marked degree of immunity, which was of considerable duration. The question then was to obtain a corresponding degree of immunity by artificial means.

It was found that injection of virus killed by heat or by chemicals had no preventive action whatsoever, and people so inoculated invariably reacted to injection of the living virus. It was also found that neither the serum nor whole blood of convalescents had any action whatsoever on the virus either *in vitro* or *in vivo*; also a mixture of the virus with serum of convalescents was always infective.

Attempts were then made to obtain an attenuated living virus for purposes of inoculation and prevention; the suggestion being that such a virus might give rise to so-called 'inapparent dengue' with subsequent immunity.

The best results were obtained with a virus treated with 1/5 to 1/10 of its volume of bile. The bile was mixed with the infective blood and kept for 24 hours and it was then found that the blood was no longer infective; the time of contact was gradually reduced to five minutes, and the result was the same. But after one injection of bile vaccine, the volunteers were found still to be susceptible to an infecting dose of 2 cc. of serum. Nine people were then treated with four doses of bile-treated serum; three weeks later five were tested with an infective dose; two developed dengue and three were resistant.

Further experiments were then made with still less bile in the mixture, 1/20 of the volume, and it was found that if this proportion was left in contact for five minutes the virus was not killed, but was attenuated, whereas if it was left for 15 minutes, the virus was killed; also bile in the proportion of 1/15 killed the virus in five minutes.

It was found that volunteers inoculated with bile virus 1/15 were no longer susceptible to 1/20 bile-virus.

Twenty-two persons were thus doubly inoculated, first with 1/15 bile-virus, and later with 1/20 bile-virus; these people were then tested three weeks later with known infective doses, and only two reacted.

D. H.

Blanc (Georges) & Caminopetros (J.). Quelques données expérimentales sur le virus de la dengue. [**Some Experimental Data on Virus of Dengue.**]—*C.R. Acad. Sci.* 1929. Oct. 14. Vol. 189. No. 16. pp. 594–596. [5 refs.]

It has been shown that the serum of individuals convalescent from yellow fever protects against the virus of that disease. In view of the similarity between this disease and dengue the authors carried out the following researches.

They obtained a potent yellow fever anti-serum and injected a dose into one flank of a volunteer and a dose of dengue virus at the same time into the other flank; the volunteer after the usual incubation period developed an attack of dengue. The same result followed when the serum and virus were mixed, kept in contact for some hours and then injected into a volunteer. A yellow fever serum has therefore no action on the virus of dengue.

It has also been shown that the virus of yellow fever in the blood of patients is readily filterable, whereas the virus in the mosquito is only filterable with great difficulty; not so with dengue; the virus in the mosquito is just as easily passed through a filter as is the virus from the blood of cases of the disease.

The yellow fever virus can only be recovered from the blood up to the 3rd day (very occasionally on the 4th), whereas the authors find that the virus of dengue can be recovered from the blood as long as the fever lasts.

D. H.

KLIGLER (I. J.). **Studies on the Etiology of Phlebotomus and Dengue Fever. III. The Transmission of Dengue Fever to Monkeys.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1929. Aug. 26. Vol. 23. No. 2. pp. 193–196. [3 refs.] [Hyg. Dept., Hebrew Univ., Jerusalem.]

During the 1927 epidemic of dengue in Palestine the author inoculated Cercopithecus monkeys with the blood of patients taken during the first or second day of the fever, and noted certain changes in the blood picture of the monkeys which suggested an infection. He injected 1·5 cc. of infective blood into the arm of the monkey, and although there was no outward change and no fever, yet about the sixth day there was a marked change in the relative blood count and a decrease in the total count. This change was principally a decrease in the polynuclear cells and an increase in the lymphocytes and large mono-nuclear cells; by the eleventh and twelfth day the count had returned to normal.

The author agrees that this observation is suggestive only and requires further confirmation, which has, in part, been supplied by BLANC who has shown that the blood of Cercopithecus monkeys is infective from the fifth to the tenth day after inoculation with dengue virus. Other species of monkey when inoculated with blood from dengue cases showed no change in the blood picture.

D. H.

RAEVSKY (A. S.). [**Pappataci Fever in Turkmenistan.**]—*Rev. Microbiol., Epidémiol. et Parasit.* 1929. Vol. 8. No. 2. pp 176–180. With 4 graphs in text. [In Russian. English summary p. 227.]

An outbreak of pappataci fever in Turkmenistan (formerly Trans-Caspian region) occurred in the summer of 1928 in the village of Hadja, a railway station of the Middle Asiatic Railway.

The locality abounds in Phlebotomus and two species, *P. pappataci* and *P. minutus*, were identified.

D. H.

KANDELAKI (S.) [**Dengue.**]—*Nachrichten d. Tropischen Medizin.* Tiflis. 1929. Feb. Vol. 2. No. 2. [In Georgian script. German summary p. 177.]

The author discusses the diagnosis and etiology of the disease which appeared in Georgia following on the epidemic of dengue in Greece. He had experience of the same disease during the Great War in 1916–1917. He identifies the summer fever of Trebizond as sand fly fever, and the vector is present there. But in Batum and other ports of Georgia, where Aëdes is met with, dengue is also common.

D. H.

GASPERINI (Carlo Gasperino). Considerazioni epidemiologiche sulla dengue nelle isole Sporadi Meridionali (estate-autunno 1928).—*Arch. Ital. Sci. Med. Colon.* 1929. Aug. 1. Vol. 10. No. 8. pp. 379–388. English summary p. 388.

MEDULLA (Candido). L'epidemia di dengue in Cirenaica.—19 pp. [24 refs.] 1928. Bengasi. [Cirenaica: Ospedale Coloniale di Bengasi.]

NERI (Filippo). Sulla epidemia di dengue in Grecia nel 1928. Note epidemiologiche.—*Ann. d'Igiene* 1929. Feb. Vol. 39. No. 2. pp. 93–101. [Inst. of Hyg. & Bact., Univ., Bari, Italy.]

UNCLASSED FEVERS.

MACARTHUR (W. P.), DUDLEY (S. F.) & WHITTINGHAM (H. E.). **Tropical Fevers of Short Duration.**—*Jl. Roy. Army Med. Corps.* 1929. Oct. Vol. 53. No. 4. pp. 247–249.

This paper was the opening one of the discussion on "Tropical fevers of short duration" at the Fifth International Congress of Military Medicine and Pharmacy held in London in May, 1929. The following is a summary:—

"Diseases may be indefinite, because they are atypical examples of well-known infections, or because they are separate clinical entities that still await full description. The first class includes mild or abortive cases of such conditions as typhoid, paratyphoid and undulant fever. Malaria frequently shows a low continued fever, the paroxysms being absent and the parasites so scanty in the blood as to be easily overlooked. Abortive heat stroke may also account for some ill-defined febrile attacks, in children, and after heavy exercise, in hot climates. Dengue and phlebotomus fever are recognized as definite clinical entities, but owing to their lack of definite symptoms are frequently confused with similar syndromes. Especially is this the case with influenza, which is very common in the tropics, but rarely accompanied by nasal catarrh. The blood pictures of dengue and sand fly fever are often not sufficiently distinct from that of influenza to separate, with any certainty, these diseases. Recently spirochaetosis as a cause of short fever has attracted attention. The leptospira as a group show many variants, which although indistinguishable morphologically, yet seem able to cause clinical symptoms which vary from a day or two of pyrexia accompanied by injected conjunctiva, and a trace of albumen in the urine, up to a severe toxaemic jaundice. Weil's disease has probably at times been recorded as dengue. The more severe forms of dengue and sand fly fever should, however, be distinguished from spirochaetosis by their respective blood pictures. Weil's disease, in its turn, can generally be distinguished from yellow fever by the relative quantities of albumen in the urine. If a urine boils solid, the diagnosis is yellow fever; if there is only a trace of albumen, Weil's disease. The attempts which are being made to distinguish and describe indefinite short fevers are handicapped, and the

confusion increased, by the habit which exists in some quarters of labelling cases, in which the diagnosis is really unknown, with a definite name, for the sake of hospital records. If a case, in spite of all possible investigation, remains a " pyrexia of unknown origin " it must be honestly left as such in all sick returns."

D. Harvey.

WOLFF (J. W.). " Tropical Typhus," een vlektyphusachtige ziekte. [**Tropical Typhus, a Typhus-like Disease.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1929. May 10. Vol. 69. No. 5. pp. 429–458. With 19 charts. [55 refs.] English summary pp. 458–460. [Path. Lab., Medan.]

Since 1922 agglutinations with different strains of *Proteus X19* have been carried out as a routine in the Medan laboratory on all sera sent in for Widal tests. Out of approximately 6,000 tests a positive reaction at and above 1 /250 was found 52 times. A critical examination of these cases showed that in 29 there was evidence to justify the diagnosis of tropical typhus. Short notes of these 29 cases are given.

The author does not propose to identify tropical typhus with typhus fever since enough is not known about the epidemiology of the disease to justify such identification. Further research may show that the two are caused by organisms of the same group but are carried by different vectors.

He reviews the literature of tropical typhus, its occurrence in different regions, and the specificity of the Weil-Felix reaction, one of the main factors on which diagnosis is based.

It is shown that a positive agglutination of *Proteus X19* bacilli by sera may take place under the following circumstances :—

(1) During an attack of food poisoning, due to infection with *Proteus vulgaris*.

(2) During the course of typhus fever including tropical typhus.

(3) As a para-agglutination in the course of another disease, e.g., typhoid.

Differential points are : (i) That the agglutinins in Class I are thermostable, whereas in Classes II and III they are thermolabile. (ii) The type of strain used ; some cases of tropical typhus agglutinate indol-forming strains of *Proteus*, others the non-indol formers. (iii) In Classes I and II the titre rises during the course of the illness but not in Class III.

D. H.

VAN STEENIS (P. B.). Het vraagstuk van de febris exanthematica in de tropen ; Brill's Disease (Brill), Kumaon koorts of Tick Typhus (Megaw) Tropical Typhus (Fletcher). [**The Question of Typhus and Like Fevers in the Tropics.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1929. June 10. Vol. 69. No. 6. pp. 572–589. With 5 charts on 1 folding plate. [7 refs.]

The author gives an account of 5 cases of " tropical typhus " in soldiers at Weltevreden (Java), all corresponding to FLETCHER'S original description (see this *Bulletin*, Vol. 24, pp. 122–123). The Weil-Felix reaction was positive in high dilution. It is probable that the disease is endemic in Java, especially in the mountainous parts of the Preanger districts, where the patients apparently acquired the infection during military manoeuvres.

The author urges the application of the Weil-Felix reaction in all cases of non-classed fevers, especially in natives, to obtain information about the distribution of the disease.

W. J. Bais.

Olmer (D.) & Olmer (Jean). La fièvre exanthématique. [**Exanthematous Fever.**]—*Rev. d' Hyg. et de Méd. Préventive.* 1929. July. Vol. 51. No. 7. pp. 473–482. With 3 coloured plates. [3 refs.] Also in *Rev. Prat. Malad. des Pays Chauds.* 1928. Aug. Year 7. Vol. 8. No. 8. pp. 403–404, 407–411. [1 ref.]

The authors give a complete study of the exanthematous fever first described by one of them in Marseilles in 1925. The clinical characters are first described under three headings: (1) The clinical course; (2) the eschar of inoculation (tache noire); (3) the rash.

The *clinical course* is divided into two periods, the pre-eruptive and the eruptive. There is nothing new in the description of these stages, but it is definitely stated that relapses or recrudescences have never been noted.

The eschar.—Although not noted in every case this small "primary sore" is very frequent and can usually be found if carefully looked for; it has already been fully described by these authors and others. The enlargement of lymph glands draining the area is also noted. The sore persists for eighteen days and then disappears leaving a superficial ulceration, slightly indurated and surrounded by a reddish halo, and finally healing up some days later. [It would appear that in the class of persons among whom these cases occur evidence of insect bites in the summer season in Marseilles must be very common if carefully looked for, even in persons not suffering from fever.]

A careful description of the maculo-papular rash is given, and also of its distribution which includes the face, the palms and the soles.

Experimental work.—So far no causal germ has been isolated; but injections of the blood of cases of fever (taken about the eighth day) into the peritoneum of monkeys has given rise, after an incubation period of seven to nine days, to a definite fever which can be passed on from monkey to monkey in series. On the other hand, all attempts to produce a reaction in guineapigs have failed. An interesting point is that the monkeys which have suffered from the fever produced by the virus of the Marseilles disease react subsequently to the virus of typhus fever and vice versa. The authors state that the Weil-Felix reaction is positive in these cases up to a dilution of 1/1,000. [This is contrary to the experience and opinion of other workers.] They agree, however, that this agglutination of *Proteus X19* is slow in appearing (not till at the end of the period of fever) and is inconstant and difficult to detect.

Epidemiology.—The disease in Marseilles and its suburbs occurs in the summer, beginning in May or June, reaching a maximum in August and disappearing in October. It is not contagious from man to man. Very careful examination of the patients has failed to detect the presence of lice; the authors consider that they may be excluded from the rôle of vector and they suggest that the tick, *Ixodes ricinus*, may be the vector and the dog the carrier of the disease.

The place of exanthematous fever in the nosology.—The authors are of opinion that this disease can be clearly differentiated by its clinical, experimental and epidemiological characters from other known diseases.

There follows a discussion of the differential diagnosis between dengue, typhus and Marseilles fever. As regards dengue, the points are that in Marseilles fever the onset is not so sudden or abrupt, the pains are less violent, the rash is quite different and the temperature curve is distinct; also the agent of dengue, Aëdes, is rare in Marseilles. The Marseilles fever can be distinguished from typhus by the absence of the typhoid state, the presence of the rash on the face and the *tache noire*; but the authors attach most importance to the experimental test which has already been noted. On the other hand, they consider that the disease under discussion is clearly allied if not identical with the "fièvre boutonneuse" of Tunis, and is also similar to Rocky Mountain fever and Japanese river fever.

D. H.

Medulla (Candido). Sopra alcuni casi di febbri eruttive similari al dermotifo osservati in Tobruch (Cirenaica). (Contributo alla diagnosi del tifo petecchiale). [**Cases of Fever with Petechial Exanthem in Cyrenaica.**]—21 pp. [11 refs.] 1928. Bengasi: [Cirenaica: Ospedale Coloniale di Tobruch.]

Nine cases are recorded, occurring in 1922–26, the symptoms being headache, fever to 39·3° C., and a petechial rash. The temperature fell by crisis in 7–10 days. The Weil-Felix reaction was negative in every case, two gave a positive agglutination with *Bact. typhosum*, one with *Bact. paratyphosum A*, and three with *Bact. paratyphosum B*, but none in high dilution. [No mention is made whether the subjects had received antityphoid inoculation.]

H. Harold Scott.

Rouslacroix & Recordier. Maladie d'Olmer à forme délirante. [**Olmer's Disease with Delirium.**]—*Marseille-Méd.* 1929. June 25. Vol. 66. No. 18. pp. 884–886.

This short paper describes a severe case of Marseilles fever in which a prominent symptom was delirium of the confusion type, with complete loss of memory. The patient made a good recovery, the delirium passing off little by little with the fever, which lasted in all 14 days. An interesting point is that a "tache noire," or primary ulcer, was found on the side of the neck. On enquiry it was found that a few days before the fever commenced the patient was bitten on this spot by a tick which he removed himself: he kept three dogs which were tick infested. The Weil-Felix reaction was completely negative.

D. H.

Longo (Domenico). Un caso di tifo esantematico endemico benigno (malattia di Brill). [**A Case of Brill's Disease.**]—*Riforma Med.* 1929. July 29. Vol. 45. No. 26. pp. 889–890. With 3 text figs. [8 refs.] [Colonial Hosp., Tripoli.]

The patient a soldier, 20 years of age, came to hospital in Tripoli, having been ill for two days with general pains and anorexia. On the fifth day a macular rash appeared, most marked on the extremities and becoming

petechial. The temperature fell by rapid lysis on the tenth and eleventh days, but the rash did not fade for another week. The Weil-Felix reaction was positive up to 1 : 500.

H. Harold Scott.

COGLIEVINA (Benvenuto). Funzionalità epatica e disturbi psichici nella febbre petecchiale.—*Giorn. di Clin. Med.* 1929. June 30. Vol. 10. No. 9. pp. 543–546, 549–552, 555–558, 561–563.

CARRION'S DISEASE.

ESCOMEL (Edmundo). La maladie de Carrion ou Verruga du Pérou. [**Carrion's Disease or Verruga Peruana.**]—*Bull. Soc. Path. Exot.* 1929. May 8. Vol. 22. No. 5. pp. 348–362. [69 refs.]

This is a résumé of work done on this disease by the author and others since 1901. During this period he has had personal experience in Peru.

The name, Carrion's disease, was given in honour of the Peruvian scientist of that name who inoculated himself with the juice from a verrugous tumour and died of an acute fever with anaemia without eruption, thus demonstrating many years ago the unity of the two diseases, then called Verruga peruviana and Oroya fever. The latter name is a misnomer, as the fever does not occur in the district of Oroya, but occurred frequently among the navvies employed in building the railway to that city. The disease is actually met with only in the valleys of Central Peru at an elevation of 1,800 to 9,000 feet.

The author then describes the symptomatology of the disease which he divides into two periods, the pre-eruptive and the eruptive stages. The first is that condition previously and erroneously called Oroya fever and is characterized by fever, weakness, intense anaemia and pains in the joints; at this time there is a marked leucocytosis and numerous *Bart. bacilliformis* are found in the red cells. This period lasts about two weeks and may either end fatally, as it frequently does, or pass on into the eruptive stage. In the verruga stage, small pimples appear, these are at first intradermal, but later become nodular and, later still, resemble chilblains and may break through the skin, ulcerate and coalesce, destroying large areas of the skin. The eruption then gradually disappears and convalescence begins.

Microscopically the Bartonella are found in the endothelial cells of the verrugous tumours. These bodies were first described in 1905 by Professor BARTON of Peru, and named by STRONG *bacilliformis*. As the bacillary form is not the only one, the author suggests the name Bartonella peruviana to cover all the forms found in the disease. A brief description of the parasite and the situations in which it is found is then given. The author is of opinion that this body is the sole and only cause of Carrion's disease.

Reference is made to the successful cultural experiments of NOGUCHI and his co-workers and also the successful inoculation of monkeys by the same author, work which has again confirmed the unity of the fever stage and the eruptive stage.

The diagnosis and prognosis of the disease are then discussed and it is pointed out that the latter is always grave in the first or fever stage.

Unfortunately, so far, there is no drug which exerts any specific action on the malady.

D. Harvey.

NOGUCHI (Hideyo), MULLER (Henry R.), TILDEN (Evelyn B.) & TYLER (Joseph R.). **Etiology of Oroya Fever. XV. Effect of Immune Serum on the Course of *Bartonella bacilliformis* Infection in *Macacus rhesus*.**—*Jl. Experim. Med.* 1929. Sept. 1. Vol. 50. No. 3. pp. 355–364. With 12 figs. on 2 plates. [1 ref.]

The experiments recorded in this paper, in tabular form, were carried out to test the inhibitory power on Bartonella of large doses (20 cc.) of serum taken from patients convalescent from Oroya fever. The serum was given 24 hours before the intradermal and intravenous injection into monkeys of a highly virulent strain of Bartonella which had been isolated from Phlebotomi. A control animal developed severe skin lesions within two weeks and its blood yielded cultures of *Bartonella bacilliformis* in a dilution of 1/10,000 after ten days; the treated animals remained free from lesions for 25 days and cultures of the blood were sterile. However, in two of these animals, typical nodules developed after 25 days at the site of the intradermal inoculation, showing that the parasites had not been killed but had been inhibited until the period of passive immunity conferred by the serum had passed off. This conclusion was verified by further experiments. When the convalescent serum was given after the appearance of the nodules it had no effect on these, but the parasite disappeared from the blood. It is suggested that convalescent serum might, with advantage, be employed in the treatment of the disease in man.

D. H.

NOGUCHI (Hideyo), MULLER (Henry R.), TILDEN (Evelyn B.) & TYLER (Joseph R.). **Etiology of Oroya Fever. XVI. Verruga in the Dog and the Donkey.**—*Jl. Experim. Med.* 1929. Oct. 1. Vol. 50. No. 4. pp. 455–461. With 8 figs. on 3 plates. [11 refs.] [Rockefeller Inst. for Med. Research, New York.]

In an attempt to find susceptible animals for experimental research with Bartonella, Noguchi and BATTISTINI tried various species of monkeys, as well as dogs, rabbits, rats, mice and guineapigs. Only the Rhesus monkey gave definite results. Later, experiments were started with horses, dogs and donkeys, but only in one donkey and in a dog was any definite result obtained, and the presence of *Bartonella bacilliformis* demonstrated by culture and by passage to Rhesus monkeys. The reaction produced in these animals was entirely local; blood cultures were invariably negative.

D. H.

DA CUNHA (Arístides Márquez). Verruga del Perú. [**Verruga peruviana.**] —*Prensa Méd. Argentina.* 1929. June 30. Vol. 16. No. 3. pp. 166–175. With 12 text figs. [Oswaldo Cruz Inst., Rio de Janeiro.]

A good general description of Carrion's disease and the experimental work in connexion with inoculation of cultures of *Bartonella bacilliformis* in monkeys to demonstrate that Oroya fever and Verruga are manifestations of the same disease. Microphotographs of the blood-pictures and of the tissue changes are given. The condition described by BASSEWITZ as occurring in Rio Grande del Sul and named by him *Angiofibroma cutis circumscriptum contagiosum* bears many resemblances to verruga, but runs a mild, afebrile course; this should be investigated further with a view to determining whether it also is a manifestation.

H. Harold Scott.

MISCELLANEOUS.

THORNTON (C. V.). **Treatment of Non-Specific Diarrhoea in the Tropics.** —*Brit. Med. Jl.* 1928. Nov. 10. pp. 843–844.

The author, in Bombay, refers to the frequency of non-specific diarrhoea in the tropics and the difficulty of successful treatment. He classes the causes of tropical diarrhoea as: (1) the dysenteries; (2) sprue; (3) tubercle or syphilis; (4) others; mentioning also food poisoning and cholera. The causes under headings (1) (2) and (3) are readily eliminated. In (4) there is no pain, nor change in the colour of the liquid motions, but ingestion of food causes prompt evacuation. He refers to recent work of H. SCOTT, which tends to show that in sprue some substance produced by the liver and probably a hormone is diminished in quantity. Absence of this hormone means non-digestion of food and hurrying on of bowel contents. Acting on this hypothesis the author avoids purgatives, puts the patient to bed for three days on citrated milk in small and frequent quantities and administers liver in powdered form, or as soup. Calcium lactate may also be given. The success, he says, is most striking.

A. G. B.

HERMITTE (L. C. D.). **Treatment of Non-Specific Diarrhoea in the Tropics.** [Correspondence.]—*Brit. Med. Jl.* 1929. Feb. 2. pp. 220–221.

Referring to THORNTON'S article (above) the author writes that after 5 years' experience in Assam and 2 in the Seychelles he believes there are few cases of diarrhoea in the tropics to which a definite cause cannot be assigned. In Assam the condition which gave most concern was "choleraic diarrhoea," a very acute gastro-enteritis which was not cholera. This could be classified in 5 main groups—acute bacillary dysentery, algid subtertian malaria, mushroom poisoning, food poisoning, cause unknown. He suggests that THORNTON has overlooked diarrhoeas caused by intestinal protozoa (other than *E. histolytica*) and helminths and lists *Balantidium coli, Entamoeba coli, Giardia intestinalis, Trichomonas hominis, Chilomastix mesnilii, Blastocystis hominis, Strongyloides stercoralis* and even ascaris, ancylostomes and Trichiuris. [Curiously he does not mention spirochaetes.] For protozoal parasites he has found stovarsol a specific. He has had 35 cases of balantidiasis under his care in Seychelles, all cured by stovarsol. He thinks the opportunities for liver therapy are restricted.

A. G. B.

MORGAN (W. Bonner). **Burning Feet.**—*Malayan Med. Jl.* 1929. June. Vol. 4. No. 2. pp. 69–70.

This is a disease with which all engaged in estate practice in Malaya are familiar. The symptoms are described. The subjects are Tamil emigrants who are thin and weak, and complain of mental depression and insomnia. More than half showed "small black cutaneous nodules over the external surfaces of the legs and forearms which disappeared

under treatment." All had left India about a year, and were recruited from districts in S.W. Madras with a rainfall too low for cultivation of rice ; it is probably the shortage of cereals which occasions their departure. Nineteen severe cases were treated in hospital with nitroglycerine internally and injected into the legs. The diet was No. 1 hospital diet with Indian corn, ragi and additional eggs and mutton : cow's milk was not available. Pain was less in a week and practically gone in a fortnight. On their discharge they were told to eat Indian corn and ragi. Seventeen of the patients were weeders and 13 females. It is noted that weeders get less pay than tappers and presumably poorer food, and that though Telegus were working on these estates none of this race was among the patients. Telegus feed better than Tamils. An enquiry 4 months later showed that 12 were at work, and 6 had disappeared or gone to India. The administration of nitroglycerine was suggested by the idea that there was over-stimulation of the sympathetic nerves, due to deficiency of vitamin B group.

A. G. B.

LABERNADIE (V. G. F.). A propos d'un cas de "Burning of the Feet." [**A Case of Burning of the Feet.**]—*Far Eastern Assoc. Trop. Med. Trans. Seventh Congress, British India, 1927.* Vol. 1. pp. 13–15. [4 refs.]

Major Labernadie of the Pondicherry Laboratory refers to MALCOLMSON'S account of this disease [see this *Bulletin*, Vol. 26, p. 423]. It appears that burning of the feet was known in Europe before MALCOLMSON. In 1762 it was recorded from Savigliano in Piedmont and in 1806 among troops in Padua ; it was called pedionalgia, or chiropodalgia if the hands were also attacked. [The affection of the hands suggests that the condition may not be the same as in the Eastern Tropics.] The same symptom, or symptoms, was reported elsewhere in Europe, and later was named acrodynia. [Here again the upper extremity suffers as well as the lower.]

In 1861 COLLAS described 3 cases of "Burning of the Feet" from Pondicherry (*Ann. Hyg. Med. Col.*, 1911, Vol. 14, p. 828). The author here describes a case in a woman, of syphilitic origin and cured by antisyphilitic treatment. He considers the condition to be a polyneuritic syndrome of varied etiology.

A. G. B.

ROEGHOLT (M. N.). Bijdrage tot de chirurgie van de lever en de galblaas in Indië. [**Surgery of Liver and Gall-Bladder in the Dutch East Indies.**]—*Nederl. Tijdschr. v. Geneesk.* 1929. Feb. 16. 72nd Year. 1st Half. No. 7. pp. 826–834.

Roegholt gives an account of his surgical experience during four years at Semarang (Java).

1. Clinically manifest *cholelithiasis* is rare in Java, though stones were found in the biliary passages in 5 per cent. of 180 post-mortems at Semarang [probably less frequently in other parts of Java]. In the author's three clinical cases operation was refused.

2. *Cholecystitis* was rarely seen, but the author believes that only a small part of these cases come under medical observation. Gastro-intestinal disturbances are prevalent enough in the natives to account for some frequency of ascending infections of the bile passages.

3. In cases of *cirrhosis of the liver* Roegholt once extirpated the spleen in a case complicated with jaundice, with apparent beneficial influence on the latter symptom. In a few cases he performed RUOTTE's operation, i.e., the implantation of the vena saphena in the peritoneum. In some of these cases the success was obvious, in others the vein was obliterated after some time. The technic requires the utmost subtility. Failure on one side, however, leaves the possibility open to try the operation on the other side.

4. *Syphilis of the liver* is mentioned with the warning to be reluctant to administer arsphenamin in this disease; the drug is apt to cause atrophy of the liver and subsequent death of the patient.

5. *Amoebic liver* is most interesting as regards its pathogenesis.

The preponderance of the right lobe as the site of liver abscess is not yet sufficiently explained. In case of haematogenous infection of the liver, SEREGE's theory of the separated blood currents from different parts of the gut in the large portal vein could account for the facts. A purely anatomical explanation, however, may be found in the theory of the lymphogenic spread of the amoebae, either from caecum, via superior mesenteric lymph vessels, the efferent vessels of the subpyloric chain and the hepatic chain to the liver (POIRIER), or from caecum, via superior mesenteric glands, pre-aortic glands, the coeliac group of these and the hepatic glands to the liver. The greater prevalence of liver abscess in the male is probably simply caused by the higher frequency of amoebic dysentery in men. The author is not convinced of the greater disposition of Europeans and Chinese to liver abscess in comparison with the Malay. Many cases in natives may escape attention. As regards treatment he prefers the open surgical treatment of the abscess.

6. *Wounds of the liver* were always fatal if the liver was actually torn. A gunshot wound without complication healed quickly; two others with complications died.

7. *Primary cancer of the liver* was fairly common.

8. One case of *ascariasis of the liver* is mentioned, in which the patient died from sepsis.

W. J. Bais.

LIPSCOMB (F. M.). **A Case of Cirrhosis of the Liver.**— *Jl. Roy. Army Med. Corps.* 1928. Dec. Vol. 51. No. 6. pp. 458–460. [5 refs.]

A European soldier, aet. 25, with 6 years' service in India. From March 1925 onwards, 6 admissions to hospital for undiagnosed short pyrexial attacks. August 1925, syphilis; treatment completed in March 1926. September 1927, began to lose weight. November, a rigor, backache, and palpable spleen; malarial parasites not found. December, abdomen noted swollen. Admitted to hospital December 10th with free fluid in abdomen, oedema of feet and bases of lungs, blood picture normal. December 11th, abdomen tapped; no viscus could be felt. Irregular pyrexia with at one time tertian periodicity; exhaustive blood examination showed no evidence of malaria. Wassermann negative. Two attacks of colic on right side abdomen. Death in coma after 4 tappings, February 1928.

Autopsy showed an atrophic hobnail liver, weight 36 oz.; microscopically, atrophic multilobular cirrhosis with extensive fatty degeneration. Caecum thickened and oedematous, mucous membrane healthy. Marked infiltration of submucosa and muscular layers with small round cells; between these two layers, aggregations of polymorphs, almost amounting to small abscesses. Spleen moderately enlarged with general congestion; no malaria parasites.

The author thinks that the disease began with the undiagnosed infection in 1925, that the condition of the caecum and history of colic point to a chronic infection in the area drained by the portal vein, and that neither alcohol nor malaria was a cause. "It is instructive to note how easily the early symptoms of cirrhosis of the liver may be mistaken for 'clinical malaria.'" Reference is made to a paper by Hughes & Shrivastava (see this *Bulletin*, Vol. 25, p. 395).

A. G. B.

Uhlendorf (Elsa). Ueber Appendicitis in exotischen Ländern. [**Appendicitis in Exotic Countries.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1929. Feb. Vol. 33. No. 2. pp. 105–124. [3 pages of refs.] [Trop. Inst., Tübingen.]

Aside from Europe and North America, where appendicitis is a common disease, there is much difference of opinion about the frequence or rarity of this condition. Those who consider it to be rare seem the more numerous. The author makes a regional survey of the literature, considering in turn China, India, the Indian Archipelago, the South Sea, Asia Minor, Africa, Central and South America. Only in Africa and the interior of Asia Minor does the rarity of appendicitis seem to be generally recognized. From China there is most information: 176 authors are for rarity, and 14 for frequency. The author discusses China at some length and gives many reasons why the conclusions of the former are to be mistrusted. Many give no details of the duration of their stay in the district. The Chinese are reluctant to consult the "foreign devil doctor," and if they do so it is usually for a visible disease. They have a dread of abdominal palpation, because it is often a preliminary to operation. They have small fear of death, but much fear of pain, which the native doctor will relieve with opium. If a Chinese is brought to consider operation he must consult his family and select a favourable day, so that the opportunity may pass. Should he reach the hospital, light diet may cause him to take flight. In the author's opinion the rarity of appendicitis is only to be gauged in comparison with the figures for other abdominal conditions. On the whole she is inclined to range herself with those who believe that appendicitis is common in China. She discusses the records from other countries and reaches the obvious conclusion that, while cases of appendicitis have been described from all countries, until critical evaluation of exact hospital statistics is possible statements about frequency or rarity are vain.

A. G. B.

Sitsen (A. E.). Ueber Appendizitis auf Java. (Zugleich ein Beitrag zur Lehre von der Ätiologie der Wurmfortsatzentzündung.) [**Appendicitis in Java. Its Etiology.**]—*Wien. Med. Woch.* 1928. Nov. 10. Vol. 78. No. 46. pp. 1453–1454, 1457–1458. [4 refs.] [Dutch Indies Med. School, Soerabaja, Java.]

Java is suitable for the study of the etiology of appendicitis, for there is a big native (Malay) population (33 millions) and a large number of Europeans, including half-castes, some 130,000. Unfortunately the author offers no statistics. It is believed that the disease is rare

among the Malays, and such figures as he can give tend to bear this out. Possible causes are discussed, with the conclusion that appendicitis is in some way attributable to a meat diet.

A. G. B.

Guerin & Mattlet. Quelques observations qui permettent d'affirmer l'existence du bacille diphtérique dans le Ruanda-Urundi. [**The Presence of the Diphtheria Bacillus in Ruanda-Urundi.**—*Ann. Soc. Belge de Méd. Trop.* 1929. Mar. 31. Vol. 9. No. 1. pp. 31–35.

In the course of seven years with a daily average of 80 new cases six cases have been seen in which diphtheria was diagnosed. Four of the cases were severe conjunctivitis, one-sided in two instances. A pure culture of a bacillus indistinguishable from the diphtheria bacillus was obtained and cure resulted from injection of the " antidiphtheria vaccine " of the Institut Pasteur, Paris. In the fifth case there was paralysis of the lower limbs and lumbar muscles, so that the patient could not sit, and paralysis of muscles of pharynx and larynx with return of fluids through the nose. A severe sore throat with fever six months before had been followed a fortnight later by loss of voice and difficulty in swallowing. After 14 days of treatment with serum and strychnine the patient left hospital and walked 16 kilometres home. The morphology and cultural characters of the bacillus isolated from 5 of the cases are given. An inoculated rabbit was ill, but recovered.

A. G. B.

Rambo (V. C.). **Diphtheria an Ever-Present Danger in India: a Report on a Series of Cases in Bilaspur District, Central Provinces, India.** —*Indian Med. Gaz.* 1928. Oct. Vol. 63. No. 10. pp. 575–578.

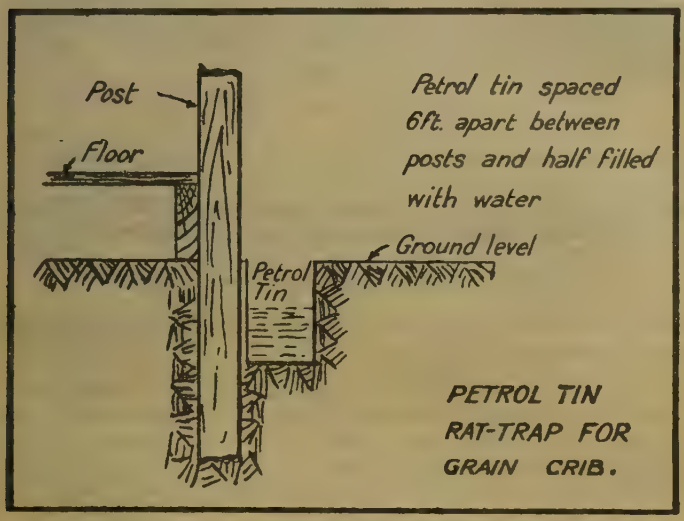
On his arrival in India the author was told, on the one hand, that diphtheria is exceedingly uncommon in that country and, on the other, that 4 boys of the Mission to which he was attached had died, 2 from undoubted and 2 from probable diphtheria. He here describes a series of 11 cases which occurred between November and March, all authenticated by a trained observer and many by smears. Of the 11, 8 were in children (6 European, 2 Indian). Antitoxin was used in all cases ; there were 3 deaths. The author concludes that diphtheria should be thought of and looked for in all cases of colds and sore throats and antitoxin given immediately if there is any doubt ; atypical cases are the rule. Diphtheria antitoxin should be kept in all dispensaries and stations. The susceptibility of Indians to diphtheria should be further studied.

A. G. B.

Martin (K. A. T.). **A Simple Method of Rat Destruction.**—*Kenya & East African Med. Jl.* 1928. Apr. Vol. 5. No. 1. pp. 16–17. With 1 text fig.

The method of rat catching described has been used with success on East African farms. The material required consists of empty 4-gallon gasoline cans.

"The top is taken off the tin, which is then sunk in the ground so that the open top is flush with the ground level; the tin is then half filled with water. A rat, which falls in, or overbalances in an attempt to get the water, is unable to get out, and quickly drowns."


Post
Floor
Petrol tin spaced 6ft. apart between posts and half filled with water
Ground level
Petrol Tin
PETROL TIN RAT-TRAP FOR GRAIN CRIB.

[Reproduced from the *Kenya and East African Medical Journal*.]

"It is also important to change the water in the tins every day if possible. A little ingenuity will camouflage the tops."

J. F. C. H.

HEALTH. Melbourne. 1927. Jan. Vol. 5. No. 1. pp. 24–25.

Aspects of Mosquito Control Operations.

"In the *Proceedings of the Royal Society of Queensland*, Vol. xxxviii, No. 6, September, 1926, there appears a paper on 'Effects on Mosquito Larvae of a Queensland Nitella,' by Mr. E. W. I. Buhot, an inspector of the Queensland Department of Public Health. Mr. Buhot notes the previous work of Cabellero, of Spain (1919), Blow, of Madagascar (1924), and the negative findings of McGregor (1924) in connexion with the effects of various species of *Characeae* on mosquito larvae. The results are given of experiments carried out at Brisbane with a fresh-water plant obtained locally from various creeks, and provisionally named *Nitella phauloteles* by Groves. This plant grows prolifically beneath the surface in either running or stagnant water, reproduces freely, and is easily transplanted. Grown in an aquarium, it caused a green surface scum and a thin oil-like film on the water. In the aquarium in which this *Nitella* was growing, larvae of *Culex quinquefasciatus* (*C. fatigans*) were killed. When mosquitoes were kept in cages over this aquarium, no eggs were laid on the water by *Aëdes argenteus* (*Stegomyia fasciata*), *Culex quinquefasciatus* or *Anopheles nyssorhynchus*. Female mosquitoes were continually found dead on the surface of the water. In control aquaria, without *Nitella*, but with other water plants, over which these mosquitoes were similarly caged, eggs were freely laid on the water.

"Whatever properties are imparted to the water by this *Nitella*, the water is not poisonous to animals or man. Rats given only this water to drink were not affected, and after being killed, showed healthy internal organs on examination. Fish and water slugs thrived in the water. Two glasses of water were drunk daily by Mr. Buhot from the aquarium over a period of two months. Mr. Buhot's conclusions are that the introduction of this plant should prove of great utility in eliminating mosquito breeding from ornamental ponds and from swamps and lagoons." [See this *Bulletin*, Vol. 25, p. 806, Vol. 26, p. 246.]

J. F. C. H.

WICKERSHAM (William W.). **Edema Disease among Haitian Prisoners. The Factors probably Responsible for its Disappearance.**—*U.S. Nav. Med. Bull.* 1929. Jan. Vol. 27. No. 1. pp. 69–73. [4 refs.] [Summary appears also in *Bulletin of Hygiene.*]

Previous to 1920 a disease characterized by oedema was very prevalent among the inmates of the prisons of Haiti and caused a high mortality rate. As a result of hygienic and dietetic reforms this disease has now practically disappeared. The prisoners instead of being closely confined were allowed to be outside all day and vegetables, fruit, eggs, beef, and pork were increased, or added to the daily dietary. The diet previously consisted chiefly of rice, dried beans, corn meal, sugar cane and fruit, with fresh vegetables and meat in small amounts at infrequent intervals. The oedema disease of the prisoners appears to have been very similar to the "nutritional oedema" observed in some parts of Europe during the War. The latter was probably due to the effects of a low calorie diet with a low protein content. There was no calorie deficiency in the diet of the Haitian prisoners prior to 1920 but there was a definite deficiency of animal protein and this is thought to have been the most important etiological factor in the production of oedema disease. A deficiency of vitamins A, B, and C may have been a contributory factor, as may lack of sunlight [see *Tropical Diseases Bulletin*, Vol. 17, p. 249; Vol. 22, p. 157].

H. N. H. Green.

DE RIVAS (Damaso). Nova contribuição para o tratamento das infecções intestinaes ou de outra natureza pelo methodo thermico intra-intestinal. Conferencia feita na Associação Medica de Porto Rico. [**The Treatment of Intestinal Infections by Hot Liquids.**]—*Rev. Med.-Cirurg. do Brasil.* 1929. Feb. Vol. 37. No. 2. pp. 33–39. [2 refs.]

Protozoal and metazoal parasites are destroyed by a temperature of 45°–47° C. in 10–15 minutes. The author treats infections of the large bowel by rectal administration of saline at a temperature of 50°–55° C., in order that it may not fall below 45° for the specified time. Where the small intestine is to be treated, the fluid is passed by a duodenal sound. [See also this *Bulletin*, Vol. 25, p. 450.]

H. Harold Scott.

Borruso (Gaetano). Su un caso di favismo. [**A Case of Favismus.**]—*Policlinico.* Sez. Prat. 1929. Mar. 11. Vol. 36. No. 10. pp. 338–341. [14 refs.]

The term Favismus is applied to a symptom-complex of rise of temperature, jaundice, anaemia and haemoglobinuria, following the ingestion of the bean or apparently even inhalation of the perfume of the flowers. The condition occurs widely in Sardinia, Sicily, Southern Italy, and Calabria, and sporadic cases are met with in Rome, Pisa and Mantua. Other districts seem to be free from it.

Details are given of one patient, a man of 56, who had had a similar attack 34 years previously. He was very ill, with icterus, mental hebetude, involuntary passage of bile-stained urine, and the anaemia was severe, red corpuscles 1,490,000 per cmm., Hb 30 per cent. When he left hospital a month later, the red cells had risen to 3,782,000 and the Hb to 65 per cent. Experimental inoculation, intravenous or subcutaneous, of 20–40 cc. of watery extract of fresh or dried beans into guineapigs or rabbits produced polypnoea, tremors and convulsions, symptoms quite different from the clinical picture of favismus. The author inclines to the idea that the disease is an expression of anaphylaxis.

H. Harold Scott.

Chavarría (A. Peña) & Nauck (Ernst G.). Zur Rhinosklerom-verbreitung in Mittelamerika. [**Distribution of Rhinoscleroma in Central America.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1929. Jan. Vol. 33. No. 1. pp. 12–18. With 8 text figs. [San Juan de Dios Hosp., San José, Costa Rica.]

Two cases are here reported from Costa Rica, where five cases have been seen in four years. For the rarity the reason is suggested that the number of Indians is small. The patients were treated with intravenous injections of tartar emetic: 35 and 45 injections of a 5 per cent. solution with 0·5 to 1·0 cc. for a dose, and with X-rays, with complete success in one case; in the other there was improvement and cure was completed by removal of tissue.

A. G. B.

Legendre (J.). La mère, la chèvre et l'enfant en Afrique tropicale. [**Mother, Goat and Child in Tropical Africa.**]—*Presse Méd.* 1929. Jan. 2. Vol. 37. No. 1. pp. 11–12. With 3 text figs.

Legendre questions whether anyone has seen a baby in Tropical Africa or Madagascar fed on any milk other than human. The result is that if the mother fails and a human substitute is not available the infant succumbs. To this and the practice of abstaining from sexual relations during the long period of lactation, 20 months or more, he ascribes the failure of growth of population in many parts of Africa. He suggests that the Africans should be induced to make use of goat's milk either direct or by a feeding bottle when the mother's fails and to wean their infants at the same age as in Europe.

A. G. B.

Donnison (C. P.). **Blood Pressure in the African Native. Its Bearing upon the Aetiology of Hyperpiesia and Arterio-Sclerosis.**—*Lancet.* 1929. Jan. 5. pp. 6–7. [7 refs.]

The investigations recorded in this paper were made on natives resident in a large reserve, that of S. Kavirondo in Kenya Colony, living in primitive conditions, that is conditions which have remained unchanged probably for centuries. Men only were examined, chiefly young men recruited for labour needs in various parts of the Colony; older men were seen when the author was on tour. The places of examination were at 5,700 feet and down to 3,500. It seems unlikely, he writes, that such altitudes could have any marked influence upon the blood pressure of the inhabitants. The ages were estimated. The instrument used was an aneroid sphygmomanometer by Down Bros. A series of 1,000 examinations was made on apparently healthy natives ranging from 15 years to 70 or 80 years.

			Blood pressure.			Normal in Europeans and Americans.		
Age Group.	Cases Examined.	Aver. Pulse-Rate.	Aver. Syst.	Aver. Diast.	Aver. Diff.	Syst.	Diast.	Diff.
15–19 ...	99	68·71	123·07	81·89	41·18	123	80	43
20–24 ...	100	63·22	122·76	79·99	42·77	125	81	44
25–29 ...	100	63·57	126·37	83·96	42·41	126	82	44
30–34 ...	115	64·55	126·05	84·73	41·31	127	83	44
35–39 ...	100	69·46	125·55	85·86	39·69	128	84	44
40–44 ...	93	68·52	118·32	81·29	37·03	129	85	44
45–49 ...	96	69·17	113·19	75·50	37·69	131	86	45
50–54 ...	100	72·20	109·79	74·09	35·70	133	87	46
55–59 ...	100	70·73	106·59	69·63	36·96	135	88	47
60 and over ...	97	75·23	105·76	66·98	38·78	140+	90+	50+

Syst. = systolic; diast. = diastolic; diff. = differential.

Up to the 4th decade the figures for the two races approximately agree. After that the blood pressure, both systolic and diastolic, tends to come down in the African, whereas in the white races it continues to rise till the 8th decade.

The author spent over two years at a native hospital where about 1,800 patients were admitted and thus had a good opportunity of recognizing pathological conditions which might be the result of high blood pressure. No case of raised blood pressure was encountered and never was a diagnosis of arteriosclerosis or chronic interstitial nephritis made. Hypertrophied hearts, without intrinsic cardiac disease, are very rarely met with in the African. In autopsies it has been noted that the African usually shows much less atheroma in the aorta than does an average European of the same age.

The results, then, of this investigation support the view that hyperpiesia and arteriosclerosis are diseases associated with civilization. Considering the causation of high blood pressure the author discusses the two main views, the toxaemic theory, and that of the over-responsive vaso-motor system, or mental stress theory; he favours the latter and

concludes that differences in the evolution of the two races must be held responsible for the differences in the normal standards of blood pressure.

A. G. B.

GALSTAUN (S. G.). **The Radiological Appearances found in Amoebic Hepatitis and Madura Foot.**—*Far Eastern Assoc. Trop. Med. Trans. Seventh Congress, British India, 1927.* Vol. 1. pp. 429–433.

Amoebic hepatitis. The author has had many cases in which the ordinary methods failing, he has been the first to diagnose the condition. Histories of three cases are given. He concludes :—

" Radiology is of the greatest value in the diagnosis of hepatic abscess and amoebic hepatitis.

" The chief radiological signs are :—

" 1. Fixation of the diaphragm on one or both sides, or limitation of movement.

" 2. Enlargement of the liver.

" 3. Raising of the level of the diaphragm on the affected side."

Madura foot. He has been unable to find any adequate description of the radiological appearances of this condition. From his experience of many cases in a period of three years he concludes :—

" The radiological appearances of Madura foot are in some respects similar to those of tubercle with certain characteristic differences :—

" 1. The disease starts externally and invades successively subcutaneous tissues, muscles, joint capsule, synovial membrane and bone.

" 2. It never starts as a bone focus as in many cases of tubercle.

" 3. The cuneiforms are the seat of election.

" 4. The ' pencilling ' of outline seen in the decalcified tuberculous bone is not characteristic of Madura foot."

In discussion Colonel SHORTEN remarked that much benefit and in some cases complete cure may result from medium deep X-ray therapy given in fractional doses.

A. G. B.

CLAXTON (E. E.). **Some Observations on the Anaemia of Indian Labourers and its Treatment with Fresh Liver.**—*Malayan Med. Jl.* 1929. Mar. Vol. 4. No. 1. pp. 8–11.

Anaemia is a common symptom of Tamil labourers. The causes are various, and include malaria, helminthiasis, malnutrition, chronic sepsis (chiefly oral), chronic colitis, bleeding piles, chronic nephritis, pregnancy, the commonest being ankylostomiasis and chronic malaria. The anaemia accounts for the poor work done by the coolies. The author lays stress on the importance of frequent inspection with a view to early detection of cases, because the longer an infection has lasted the more difficult it is to treat. After detection and removal of the cause of the anaemia liver treatment accelerates the recovery of the normal state of the blood. A series of 239 cases has been treated, and only those whose haemoglobin has been less than 60 per cent. (Tallquist) have been included in the observations. The method of preparation is as follows :

" Fresh liver is taken and minced very finely ; it is then covered with equal weight of water, and enough common salt is added to make the solution hypertonic. The mixture is stirred, and allowed to stand for

1½ to 2 hours: when it is heated gently on a water bath for 20 minutes, care being taken that it does not boil. The filtrate, after straining through muslin, is ready for use. Proportion of ingredients used are 2½ lbs. fresh liver, two pints water and ½ oz. common salt. The dose given is 2 ozs., twice a day on two days in a week."

The table shows 10 selected cases.

TABLE A.

Hospital reference No.	Age and Sex.	Cause of Anaemia.	Hb. per cent. on admission.	Days in Hospital.	Haemoglobin.		
					On discharge.	After one month.	After two months.
L.725	7 M.	Amoebic dysentery	25	17	60	Returned to India.	
B.D. 167	7 F.	Anky. and Malaria B.T.	20	18	65	70	90
L.494	10 M.	Anky.	45	85	60	70	60
L.712	11 F.	Ascariasis	35	8	65	65	80
L.557	28 H.	Anky.	45	10	60	60	60
L.599	26 M.	Malaria B.T.	40	9	65	60	80
L.633	26 F.	Malaria S.T.	45	12	60	60	65
L.708	26 F.	Anky. ...	50	8	65	60	80
B.W.281	28 M.	Anky. ...	45	11	60	65	70
S.S.445	51 F.	Anky. and pneumonia	40	23	60	50	Paid off

This series of cases was compared with a similar series from the preceding year; the treatment was almost identical with the exception of liver. Liver shortens the average period in hospital by 4½ days and the average rise of haemoglobin is increased by 6·9 per cent. Moreover, the patients are discharged in better condition. Difficulty was experienced in getting liver owing to an epidemic among goats which led to large losses. Better results might have followed daily administration. The most resistant cases were pregnant women with chronic malaria and hookworm. The essential preliminary, of course, is the removal of the cause.

A. G. B.

BIRT (Ed.). Gutartige Strikturen des Rektums. [**Non-Malignant Strictures of the Rectum.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1929. Jan. Vol. 33. No. 1. pp. 1–11. With 7 text figs. [Paulun Hosp., Shanghai.]

A lecture delivered on June 9th 1928 before the Medical and Natural Scientific Society at Shanghai, a city in which, as the reader will gather, there is no dearth of rectal surgery. Fistula-in-ano is very common. Malignant disease is present in many forms, and the large bowel is not infrequently the seat of carcinoma. Helminthiasis is widespread, and infection with the *Schistosoma japonicum* often leads to appalling local conditions. Tubercle, syphilis and gonorrhoea also play their part, and dysentery, in both its amoebic and bacillary forms, is a powerful factor in the production of intestinal lesions.

Even under favourable circumstances the normal power of resistance of the average Chinaman would appear to be considerably lower than that of the European, a matter of importance when the question of radical surgical intervention arises. The surgeon's difficulties are

increased by the general aversion of the Chinese to surgery when practised upon their own persons, and by the fact that many cases of rectal disease when they first come to notice have already reached an inoperable stage. The opium habit constitutes another adverse influence.

The lecturer, with the aid of pathological specimens, reviews some eight cases of benign rectal growth and stricture under his care in the year 1927, and to their aetiology and pathology the lecture is mainly devoted. Other cases also are quoted for purposes of comparison. In at least one instance syphilis appears to have been the causative factor, and in another gonorrhoea. Most of the remainder were undoubtedly due to the schistosome, tubercle being perhaps a contributory in one individual. Various surgical procedures were practised, ranging from simple dilatation to resection of the rectum or colostomy. Results appear to have been satisfactory, allowance being made for the difficult nature of the cases and the necessarily reduced condition of the sufferers. The lecturer is insistent upon the fact that in the type of case with which he is called upon to deal in Shanghai surgery only can afford relief. and that drugs must be looked upon merely as adjuvants. He discusses difficulties of diagnosis, the assistance afforded by the Roentgen rays, and the possibility of conditions originally benign taking on malignant action. In a supplementary note, having reference to a case later than those considered in the lecture, *Clonorchis sinensis* is suggested as a potential agent in the production of serious intestinal disease.

J. J. Pratt.

Groot (K. P.). Eenige gevallen van jicht bij Javanen. [**Cases of Gout in Javanese.**]—*Nederl. Tijdschr. v. Geneesk.* 1929. May 4. 73rd Year. 1st Half. No. 18. pp. 2142–2149. With 4 text figs., 1 chart, & 3 figs. on 1 double plate. [4 refs.]

Gout is generally believed not to occur in the Malay race. Contrary to this contention, the author asserts that he has seen 7 cases in Javanese in a material of about 40,000 cases. In 3 of these cases the diagnosis was dependent on clinical observation. By puncture the swellings were shown to contain deposits of uric acid, and X-ray examination showed the typical picture of gouty arthritis. No special cause could be found for the affection in these men, whose habits of life did not differ from the average native's (practically vegetarian diet, no alcoholics). The patients' complaints were not very marked, though the swellings were remarkably large and the attacks of very long duration in comparison with the European type of gout.

W. J. Bais.

Williams (L. H.). **Operative Gynecology in the Tropics. A Report of 100 Consecutive Gynecological Operations in the Tropics.**—*U.S. Nav. Med. Bull.* 1929. Apr. Vol. 27. No. 2. pp. 370–379. [9 refs.]

These operations were performed at Cape Haitien, Haiti, in a period of two years. Nine of the patients were Caucasians. Of 38 hysterectomies, 34 were for myoma of the uterus; this is frequently met with in negro women and is a common cause of disability. The cause is unknown. Chronic pelvic inflammatory disease, of gonococcus

origin, is a prolific cause of pain, disability and sterility among native women. Rectovaginal fistula is not infrequently seen, usually in syphilitic women with third stage lesions and often accompanied by rectal stricture. Elephantiasis of the vulva, either filarial or treponemic in origin, is fairly common, much more common than is generally believed, for many cases do not come to light. The author dwells on the necessity in the tropics for pre-operative treatment.

A. G. B.

Blanchard (M.). Au sujet des accidents d'intolérance de la ponction lombaire. [**Symptoms of Intolerance in Lumbar Puncture.**]—*Bull. Soc. Path. Exot.* 1929. Apr. 10. Vol. 22. No. 4. pp. 257–259. [2 refs.] [School of the Colonial Health Service, Marseilles.]

The author with Laigret [this *Bulletin*, 1924, p. 924] reported that the native of the Congo bears lumbar puncture extremely well, and that in fifteen years' practice at Brazzaville no symptoms, early or late, after puncture had ever been observed. He here discusses the cause of this tolerance and decides that it is due to the vegetative nervous system of the negro being "almost completely inexcitable."

A. G. B.

Le Roy des Barres. La polymyosite des pays chauds. [**Polymyositis of Hot Countries.**]—*Rev. Méd. et Hyg. Trop.* 1929. Mar.–Apr. Vol. 21. No. 2. pp. 33–49. [35 refs.]

A fairly complete account is given of this condition, known locally as lambo and bungpagga, and described fully by Kulz (1913). The list of references is useful and goes back to 1877. The author has seen 25 cases, but it is not clear to what extent in his paper he is drawing upon his own experience. The conclusion reached is that the myositis of warm countries does not differ from that of temperate countries, and since it is only the localization of a pyaemia it should not be regarded as a distinct morbid entity.

[For recent references to this subject see this *Bulletin*, Vol. 20, pp. 27–29, 904; Vol. 22, p. 347; Vol. 24, pp. 833–4.]

A. G. B.

Lister (Spencer). **An Electrical Thermometer for Groups of People.** —*Jl. Med. Assoc. South Africa.* 1929. Mar. 23. Vol. 3. No. 6. pp. 155–157. With 2 text figs.

The apparatus here described and figured was devised to pick out native mine labourers with abnormal temperatures, these abnormals to be submitted to further tests for the detection of tuberculosis. Clearly it might be useful to detect abnormals in any body of natives with whom the use of a mercurial thermometer would take up too much time. The apparatus consists of a number of thermocouples, one of which is to be placed under the tongue, the other in a thermostat kept at 98·4°, a moving-coil galvanometer with reflecting mirror, switchboard, calibrated scale, and electric lamp. The whole is clearly described.

A. G. B.

Franchini (Gianni). Di una caratteristica sindrome influenzale in Tripolitania. [**A Peculiar Influenzal Syndrome in Tripolitania.**]—*Arch. Ital. Sci. Med. Colon.* 1929. May 1. Vol. 10. No. 5. pp. 226–230. English summary p. 230.

An epidemic broke out early in January 1929 which attacked 209 of the coloured troops out of 1,000. It was characterized by sudden onset of fever to 40° C., with severe headache, general muscular pains, a troublesome dry cough, dyspnoea, anorexia, frequent epistaxis and great weakness. The spleen was not enlarged and the physical signs were very slight or even absent. Ordinary antipyretics proved ineffectual, but quinine in doses of 25 cgm. four times daily relieved all the symptoms in a few days, though the debility and anorexia remained for another week or so.

H. Harold Scott.

Ruberti-Fiera (Ernesto). Il "bigio." [**"Bigio."**]—*Ann. di Med. Nav. e Colon.* 1929. May–June. Year 35. Vol. 1. No. 5/6. pp. 336–337. With 4 figs. on 3 plates (1 coloured).

"Bigio" is the name given to an affection of the lower lip, involving the surface of the mucosa, not extending to the skin. It occurs throughout Somalia, but in the northern part is sometimes known as Habèb. It starts usually in the centre of the lip and extends to the edge and to the commissure; it is slow in growth and does not itch. There is a little secretion of a serous nature which forms a yellowish crust. The condition remains stationary for a long time, "two to twenty years," and when it heals leaves a light red surface, the pigment having been destroyed. It is not syphilitic and the cause is not known. Some have ascribed it to the use of Rumi (the massuah of the Arabs), but it is seen in small children who do not use Rumi. Various forms of treatment have been tried—local applications, antimony, arsenobenzol—but without satisfactory result. Some photographic reproductions and a good coloured plate show the appearance clearly.

H. Harold Scott.

Winchester (J. W.). **Observations on the Incidence of Lobar Pneumonia among Tamils and Chinese in Malaya.**—*Malayan Med. Jl.* 1929. June. Vol. 4. No. 2. pp. 75–77. [5 refs.]

The author studied the hospital records of the General Hospital, Singapore, from January 1926 to May 1928, in which period 540 cases of lobar pneumonia were admitted. Of these 277 were in Tamils and 165 in Chinese, though the total Chinese admissions were twice as large as the total Tamil; i.e., lobar pneumonia was nearly 3½ times as common in Tamils as in Chinese. The case fatality was 51·8 per cent., but of this the Chinese share was 72·7 and the Tamil 44·7 per cent.; the explanation is that whereas the Tamils, mostly employees under supervision, are admitted on the 2nd or 3rd day, it is unusual for the independent Chinaman to come to hospital till he has been ill a week. The author studied the possible factors of the high pneumonia incidence in Tamils. Housing, alcoholism, exposure and fatigue, diet, are considered in turn; it is only in diet that there is a definite difference between the races. The Chinese coolie spends a far larger

proportion of his earnings on food than does the Tamil. Both rely chiefly on rice, but the Chinaman eats flesh once or twice a day and usually a large piece of extremely fat pork, whereas the Tamil indulges only once or twice a week in mutton or goat flesh. Calculating the requisite number of calories required, the author estimates that the Tamil needs 1½ lb. of rice and that he eats about half this quantity, whereas the Chinese coolie comes near the number of calories he needs. The tentative conclusion is that the large incidence of pneumonia among the Tamils is due to the low caloric value of their diet. [Another possible cause is the absence of the anti-infective vitamin A (see *Bulletin of Hygiene*, Vol. 4, p. 97)].

A. G. B.

Boerema (J. C.) & Vrij (M. P.). **The Ultra-Violet Radiation in Tropical Sunlight.**—*Proc. Roy. Acad. Amsterdam.* 1929. Vol. 32. No. 4. pp. 435–439. With 1 plate. [6 refs.] [Summary appears also in *Bulletin of Hygiene.*]

According to the authors, it has been alleged that sunlight in the tropics is, as compared with that in other parts of the world, weak ultra-violet radiation. Their observations in Batavia indicate a contrary state of affairs. According to Dorno, the shortest wave length recorded at Davos is 2969 A.U., and only for one hour daily at the most favourable season. In Batavia there was found an extension of the solar spectrum to 2954 A.U. for a period of four hours daily during three months. It is considered that there is probably also a greater intensity of radiation.

R. G. Bannerman.

Traut (I. I.) et al. **Reports of Work of the Laboratory for the Study of Poison Substances of the Plant Protection Department of the People's Commissariat of Agriculture, R.S.F.S.R. Part VI.** 69 pp. 1929. Saratov. [In Russian. English summaries on pp. 21, 39, 60, 64, 68.]

During the years 1927 and 1928 a number of experiments were conducted on the efficacy of various poisonous substances for the wholesale destruction of ground-squirrels (*Citellus pygmaeus*) and their ectoparasites in the south-eastern provinces of Russia. The chief substances used were calcium cyanide, strychnine and carbon bisulphide. "Cyanogas" calcium cyanide [$Ca(CN)_2$] containing 42 per cent. CN was used in powdered form. From 5 to 60 gm. of the cyanide was introduced into each burrow, the entrances to which were then filled with grass and covered with earth.

In the experiments described 137 burrows were thus treated. The results proved to be unsatisfactory, since in only 86 burrows were all the occupants destroyed. In the remaining burrows, especially in those containing the young, the animals were able to isolate themselves from the fumes of HCN by plugging up part of the passage with earth. The ineffectiveness of this method is attributed mainly to the slow evolution of CN and the fact that the fumes, being lighter than air, do not diffuse rapidly enough into the deeper parts of the burrow. As regards the effect of the cyanide upon the ectoparasites, only part of these were destroyed on the dead animals.

A series of experiments were conducted with poison baits. The best results were obtained with millet baits soaked in a 1/400 solution of strychnine. In fresh baits the amount of strychnine was estimated at 152 mgm. per 100 gm. of millet. The efficiency of the baits did not suffer from exposure in the open, though the amount of strychnine per 100 gm. millet fell to 130 mgm. after seven days, to 97·8 mgm. after 11 days, to 73·4 mgm. after 25 days and to 24·5 mgm. after 36 days.

In a large-scale experiment about 12,800 hectares containing about 850,000 burrows were baited with this poison, the total amount used being 4·2 kgm. of strychnine and 3,720 kgm. of millet. The baits were distributed in doses of 4 gm. placed near each burrow. When the burrows were examined seven days later it was found that nearly 100 per cent. of the ground-squirrels in this area had been destroyed. A large number of ground-squirrels were poisoned by baits placed amongst rye and wheat crops.

Various other substances were tested for the simultaneous destruction of ground-squirrels and their ectoparasites in burrows. Carbon bisulphide proved to be most satisfactory for this purpose. It was introduced into the burrows on cotton wool pads or by means of a syringe. A lighted match or red-hot charcoal was then thrown in and the entrance to the burrow plugged with earth. The explosion of the gas within the burrow resulted in the complete extermination of the fleas and other ectoparasites together with their hosts in 50 per cent. of all the burrows treated, and in a partial destruction in 25 per cent. of the burrows. Carbon bisulphide worked best when introduced in doses of 15 gm. per burrow, but under certain conditions smaller doses may be sufficient.

C. A. Hoare.

Mattlet (G.). Deux abcès d'allure torpide causés par le staphylocoque. [**Abscess due to Staphylococcus.**]—*Ann. Soc. Belge de Méd. Trop.* 1929. Mar. 31. Vol. 9. No. 1. pp. 3–7. [7 refs.]

The author describes two cases of abscess of several weeks' duration. One of these contained at least 6 litres of pus. The staphylococci cultivated on agar from each abscess were two, one with cream-coloured colonies and the other with grey-white. In their characters the two were intermediate respectively between *Staph. aureus* and *citreus* and between *Staph. citreus* and *albus*.

W. F. Harvey.

Hetherington (H. B.) & Steenson (K. R.). **A Year's Hookworm and Yaws Work in the Solomon Islands.**—*Med. Jl. Australia.* 1929. June 29. 16th Year. Vol. 1. No. 26. pp. 856–861. With 15 text figs.

In 1921, Dr. Lambert, of the Rockefeller Foundation, carried out a hookworm survey of the British Solomon Islands and found an infestation of 60 to 80 per cent. This survey and the knowledge that yaws is almost universal in the Solomons led to the campaign of 1928. The campaign was financed by the Rockefeller Foundation and the Government of the Islands. The island of Malaita was chosen because it is the most densely populated and contains about half the population of the whole group, 60 to 70 thousand. The hookworm part of the campaign was rendered difficult by the existence of certain *tabus*: thus, the

native must have nothing to do with human excreta; he who possesses any portion of another's excreta can work magic against him, and it becomes a duty to compass the possessor's death.

The object of the campaign was to inspect and record every native in the district, treat all for hookworm and any who showed evidence of yaws; indeed, the authors would go further and treat all for yaws, believing that many who appear free have a latent infection. Three injections of neosalvarsan were given as a course, 0·45 gm. in each dose; it was thus hoped to reduce the sources of infection to a minimum. A detailed account is given of the personal and technical equipment and the method of working. A maximum of 300 persons a day was dealt with.

Incidence of Yaws and Extent of Treatment.

Population Census Returns.	Yaws Infections.		Stage of Infections.			Number Treated.	Number of Injections.
	Number	Percentage.	Primary.	Secondary.	Tertiary.		
18,438 ...	11,440	62	2·5 per cent.	30·5 per cent.	67·0 per cent.	11,405	30,491

The table gives the statistics of the yaws treatment. For hookworm over 16,000 treatments were given; the drug used is not disclosed.

A. G. B.

Luigi (Fornara). Les lithiases chez le noir dans le Bas-Congo Belge. [**Calculi in Blacks in Lower Belgian Congo.**]—*Ann. Soc. Belge de Méd. Trop.* 1928. Dec. Vol. 8. No. 3. pp. 311–314. [4 refs.]

Most doctors practising in the Congo are of opinion that the natives are free from this group of diseases. The author suggests that this is because the lesions they produce are silent and pass unnoticed without the systematic performance of autopsies. He has found calculi in natives on the post-mortem table at Leopoldville as follows:—

Biliary	4/600 :	0·67	per cent.
Renal	2/600 :	0·34	per cent.
Pancreatic	0/120 :	0	per cent.
Vesical	3/120 :	2·5	per cent.
Urethral	0 :	0	per cent.

At Boma he has never seen such cases [how many autopsies is not stated]. Details are given of the stones removed. In none of the nine cases was it possible to discover in the liver or portal system schistosomes or their eggs.

A. G. B.

Ibrahim (Aly Bey). [**Zeifulian Oration on Stones of the Ureter.**]—*Jl. Egyptian Med. Assoc.* 1929. June. Vol. 12. No. 6. [In Egyptian. English summary pp. 71–79. With 6 figs. on 2 plates & 1 text fig.]

In the Radiological Department of Kasr el Ainy Hospital, 10,434 patients were examined in 1927–8; 1,087 showed a positive finding

in the urinary tract and 114 had ureteric calculi. In an analysis of 100 consecutive radiograms of these, 28 cases showed evidence of bilharziasis. The author notes that a calcified bilharzial papilloma of the ureter is impossible to distinguish from a ureteric calculus.

A. G. B.

ALEIXO (A.). Melanonychia. [**Melanonychia.**]—*Brasil Medico.* 1928. Nov. 17. Vol. 42. No. 46. pp. 1281–1285. With 6 text figs. [4 refs.]

Melanonychia, Unha negra, Black-nail, is the name given to a condition in which black lines and streaks appear in one or more nails of the fingers or toes. There is no deformity of the nail, no atrophy, hypertrophy, desquamation or roughening; in fact, except for the colour there is no abnormality. No cause has yet been found except perhaps hyperchromia at the root of the nail. It is commonest in the dark-skinned, four out of five cases mentioned occurring in negroes. It is occasionally seen in subjects with naevi.

H. Harold Scott.

BOULAY (A.). Un cas de diabète sucré chez un noir d'Afrique. [**Case of Diabetes Mellitus in an African Native.**]—*Bull. Soc. Path. Exot.* 1928. Oct. 10. Vol. 21. No. 8. pp. 701–703. [2 refs.]

MONTEL has noted that while this affection is very rare among the natives of Cochin China, it affects the Hindus resident there severely, even those who are actively employed. LANGEN has noted the extreme rarity of this disease in Java. Though cases are noted in American negroes [see this *Bulletin*, Vol. 19, p. 430] the negro in Africa is believed to be refractory to diabetes. The case described is that of a Mussulman in Senegal with syphilis (B.W.+++), polyuria and loss of flesh, and glycosuria. He led an active life riding and walking over his landed property. For details consult the paper.

A. G. B.

HOWELLS (W. M.). **A Case in which no Diagnosis has been made.**—*West African Med. Jl.* Lagos. 1928. Apr. Vol. 1. No. 4. pp. 73–74.

Case of a native of about 35 years admitted into the C.D. hospital at Kumasi on the 12th day of his illness. There was oozing of blood from gums and pharynx, copious bright-red bleeding *per urethram*, and there had been bleeding from the bowel; the temperature was normal and there were no other signs or symptoms and no parasites. The man died early on the 3rd day in hospital. Post mortem slight nephritis was observed, and some necrosis and loss of epithelium of the bladder. The diagnoses considered were purpura, haemophilia, and onyalai; the cause of death suggested by the pathologist is snake-bite.

A. A.

TAYLOR (G.). **Deterioration and Preservation of Drugs in Nigeria.**—*West African Med. Jl.* Lagos. 1928. Oct. Vol. 2. No. 2. pp. 114–117.

An article which will be of value to the dispenser, medical or other, in hot climates as well as to the firms in temperate regions which export drugs and chemicals to the tropics. It cannot be summarized.

A. G. B.

RATTAN (Bhagwan). **Haemophilia in the Tropics.** [Memoranda.]—*Brit. Med. Jl.* 1928. Nov. 10. p. 844.

The case recorded was in a child at Ambala in the Punjab (30° N. Lat.).

A. G. B.

CAWSTON (F. G.). **The Need for Early Drainage in Tropical Pleural Effusion.**—*Jl. Trop. Med. & Hyg.* 1929. May 1. Vol. 32. No. 9. pp. 117–118.

Dr. Cawston writes of septic pleural effusions or abscesses, the treatment of which, once the diagnosis is made, is unaffected by latitude.

A. G. B.

MANALANG (C.). **Report of a Case of Rhinosporidiosis.**—*Philippine Jl. Sci.* 1929. Apr. Vol. 38. No. 4. pp. 437–440. With 6 figs. on 3 plates. [6 refs.]

In a boy aged 7 years. Appears to be the first case reported from the Philippines.

A. G. B.

REVIEWS AND NOTICES.

ROME. **L'agro romano nel primo quinquennio fascista. Relazione sull' incremento del bonificamento agrario e della colonizzazione nell' agro romano dal 1o gennaio 1923 (I) al 31 dicembre 1927 (VI).** [The Roman Campagna during the First Five Years of Fascist Government.—Report on the Progress of Agricultural Reclaiming and Colonization in the Roman Campagna from the 1st of January, 1923, to the 31st of December, 1927.]—191 pp. With 196 figs. & 3 folding maps. 1928. Roma: Tipografia Cuggiani, 35 via della Pace.

This report is concerned with the general agricultural and economic aspect of the intense effort which the Italian Goverment is making towards the reclaiming and the bringing under intensive cultivation of the Roman Campagna, over a territory of 135,000 hectares. In spite of the fact that the very important anti-malarial work which forms an essential part of this enterprise is only incidentally mentioned, the volume is well worthy of a note in this *Bulletin*. It is mainly a photographic documentation, demonstrating the original conditions of the Campagna, the works which are being carried out, the means which are being employed and the notable practical results already obtained. It is gratifying to see so many localities the names of which were sinisterly notorious, far afield, from the classical studies of the Roman School of Malariologists, transformed, or in the process of being transformed into florid and productive agricultural centres.

The book is splendidly illustrated with 196 photographs, plans and maps.

George Giglioli.

HASLAM (J. F. C.). **Schistosomiasis and Malaria in Relation to Irrigation.**—52 pp. With 5 maps & 2 figs. [12 pages of refs.] Empire Marketing Board 17. 1929. May. London: H.M.S.O. [1s. 3d.]

Major Walter ELLIOT, Chairman of the Research Grants Committee of the Empire Marketing Board, by which this brochure is published, in the preface which he contributes writes that Dr. Haslam's Report was prepared for the Irrigation Sub-Committee of the Committee of Civil Research as a convenient summary of practical lessons to be drawn from existing knowledge. This purpose it undoubtedly serves. The Report is clearly written and will be found by the professional as well as the lay man to be very interesting reading. It is not perhaps adequately realized in medical circles that " nearly one-third of the earth's surface receives only 10 inches of rain or less annually " even though it is well known that on such land " irrigation is generally essential if any form of profitable crop production is to be under-taken."

A valuable feature is the three maps of the world on Mercator's projection, one showing the distribution of rainfall of over 20, over 10 and under 10 inches, the second giving the distribution of the three forms of schistosomiasis, and the third that of indigenous malaria. In a pocket inside the cover will be found tracings from maps II and III which superimposed on Map I will " demonstrate that nearly everywhere that an irrigation project is likely, one or other or both of these diseases (malaria and schistosomiasis), both closely associated with water channels, is waiting on the threshold." The geographical bibliography of reported cases of schistosomiasis (pp. 41 to 50) cannot fail to be useful.

[In a personal communication, Dr. ATKEY, Director of Medical Services in the Sudan, has pointed out that my Report gives the impression that practically nothing has been done in that country to prevent the spread of schistosomiasis in the newly irrigated areas. The annual Medical Reports for the Sudan for the

years 1926 and 1927 show plainly that much has been and is being done. Even the 1926 Report, however, was not received at the London School of Hygiene until July, 1928 a few weeks before my finished Report was presented to the Irrigation Sub-Committee and, though a number of addenda were made before publication in 1929, these Reports from the Sudan were unfortunately overlooked. I much regret having unintentionally given a wrong impression of the actual state of matters in the Sudan.—J.F.C.H.]

A. G. B.

British India. **Report of the 7th Congress of the Far Eastern Association of Tropical Medicine, British India, December 5th-10th-24th, 1927.**—193 pp. 1929. Calcutta. Government of India Press.

This is one of several volumes of reports connected with this meeting of the Far Eastern Association of Tropical Medicine in Calcutta, during December, 1927. The Report begins with a special list of the Patron (The Viceroy and Governor General of India) and Vice Patrons of this meeting and the names of the Officers of this 7th Congress, all from the I.M.S., except the General Secretary Treasurer, Dr. O. Deggellar of Weltevreden, Java. Then we come to Officers of Component Countries, Members of the Council and Official Delegates and Representatives, etc., 25 pages. The net is wide spread, and draws in representatives from England, Egypt, all India, Java, Siam, China, Japan, the Pacific Islands, Australia and America. Joined to the Congress was an Exhibition, divided into two parts, Scientific and Commercial, the first for examples of research work at present being done in India, the second for equipment, literature and drugs for sale in India and, in certain cases also, the products of Indian manufactures. The opening address was delivered by Sir F. S. Jackson, P.C., G.C.I.E., Governor of Bengal. The Governor and Lady Jackson also attended the Congress dinner held on December 10th. The President of the Congress, Major General T. H. Symonds, C.S.I., K.H.S., I.M.S., read his addresss at the opening ceremony on December 5th. He gave a hearty welcome to visitors who had come very long distances, leaving work and country, to attend the 7th Congress, a meeting held for the first time in India since the first Congress was held at Manila in 1908. The last meeting was held in Japan, 1925. Pages 49 to 81 are occupied with business meetings of the Council, and with important work done at a General business meeting, held on December 8th. The following new resolutions were passed and will be in force in future : 1. " . . . hotel and touring expenses to be borne by the delegates or by their Governments and not by the Government of the country issuing the invitation," 2. " . . . that the Congress be held triennially instead of biennially." 3. " That a triennial subscription of three pounds sterling be paid in one lump sum." The resumé of the Proceedings of Scientific Sections (pp. 81–125) contains merely the names of subjects discussed in each section with the names of those who read papers which will no doubt be published in full in the Transactions. The rest of the volume is taken up with a list of members of the Far Eastern Association of Tropical Medicine.

J. H. Tull Walsh.

Deschiens (R.) [de l'Institut Pasteur, Ex-Chef de Laboratoire à l'Hôpital Saint-Antoine] & Carvaillo (R.). [Ancien interne pr. des Hôpitaux de Paris, Chef de Laboratoire à l'Hôpital Saint-Antoine]. **La coprologie en pratique médicale.** [Coprology in Medical Practice.]—pp. ix+129 With 17 plates (14 coloured) & 2 text figs. 1929. Paris : Editions médicales N. Maloine, 27 Rue de l'Ecole de Médecine.

War experience brought home to the medical profession the necessity for routine microscopical investigation of the stools in entero-colitis and

the present volume illustrates the growing importance which is attached in France to the macroscopical appearances and to the chemical, bacteriological and parasitological examination of the faeces. The earlier chapters are devoted to elementary technique and to the various reagents and tests advocated by the authors in faecal analysis.

Due stress is laid on the naked eye appearances of the stool such as its consistence, colour, odour and the presence or absence of pathological exudates like mucus, pus and blood. Tests for determining the acidity or alkalinity, albumen content, bile pigments and blood are detailed. For the detection of the latter, three tests are recommended, and Meyer's reaction with phenol-phthalein is found to be four times as sensitive as the Guaiacum test. An intestinal haemorrhage of only 0·5 cc. of blood in twenty-four hours can be detected by this means. Special significance is attached to these tests, since blood is altered rapidly in the bowel. Indeed it is only in lesions situated low down in the colon or where the rate of passage through the intestine is markedly accelerated that bleeding as such is detected by the naked eye.

The types of diarrhoea associated with deficient or ineffective gastric, biliary and pancreatic secretion are enumerated and a characteristic syndrome is detailed for each condition.

The subject of constipation is briefly reviewed. Colitis gravis is considered to have a multiple etiology, chief of which are amoebic, bacillary and flagellate dysentery, and such other diseases as tuberculosis, syphilis and cancer. Ulcerative colitis as a separate entity receives scanty consideration, and tropical physicians will be disappointed by the lack of information regarding cultural procedures in the bacillary infections. The incidence of intestinal protozoa in stools examined in Paris is stated to vary from 60–70 per cent., while that of *E. dysenteriae* (*histolytica*) is 5 per cent. *Chilomastix mesnili*, *trichomonas intestinalis* and *Giardia intestinalis* are all regarded as pathogenic.

Lamblia inhabits the level of the duodenum. It is also stated to frequent the biliary passages in heavy infections and to be associated with hypochlorhydria more frequently than hyperchlorhydria. Stovarsol, tréparsol and bismuth carbonate are the drugs recommended in its treatment. The last fifteen pages are devoted to the intestinal helminths infesting man.

This is a readable book, adequately illustrated, and of small dimensions. It suffers, however, from the inevitable defects of brevity. Many subjects, including that of therapy, receive too limited and uncritical a consideration for it to be of practical value to the medical practitioner.

N. Hamilton Fairley.

RUGE (Reinhold) [Prof. Dr., Marinegeneralstabsarzt a.d. in Klotzsche bei Dresden], MÜHLENS (Peter) [Prof. Dr., Marinegeneralarzt a.d. und Vorsteher der klinischen Abteilung am Tropeninstitut in Hamburg] & ZUR VERTH (Max) [Prof. Dr., Marinegeneraloberarzt a.d. und Oberregierungsmedizinalrat in Hamburg]. **Krankheiten und Hygiene der warmen Länder. Ein Lehrbuch für die Praxis.** [Diseases and Hygiene of Tropical Climates.] 3rd Edition, completely revised.—pp. x+494. With 8 plates (6 coloured) & 489 text figs. 1930. Georg Thieme, Verlag, Leipzig. [Paper M.39·60; Bound M.32.] [Received Dec. 2, 1929.]

In the preface to this edition it is announced that it contains the latest researches on tropical medicine and hygiene with a full account of the application of drugs made available by German science, such as plasmochin, neostibosan, etc. The cosmopolitan helminthes have been included. There are new chapters dealing with variola, tularaemia, cholera, rhinoscleroma, trachoma, and various tropical skin diseases. A number of the older illustrations have been replaced by newer and better

ones. The requirements of the ship's surgeon travelling in the tropics have been considered specially. Although much new matter has been added the authors have endeavoured to keep down the size of the work.

The book is divided into two sections, one dealing with tropical hygiene, the other with tropical diseases. The latter is subdivided into : I. Infectious diseases. II. Diseases produced by worms and arthropods. III. Tropical skin and venereal diseases. IV. Poisoning by animal and vegetable poisons. V. Surgery in the tropics. VI. Distribution of cosmopolitan diseases in the tropics. Each of these is again subdivided into various sub-headings. There is an appendix and subject index.

Pride of place is largely given to German work. This is not unnatural. Since, however, our knowledge of tropical disease has been and is being advanced by workers of various nationalities all over the world, the value and breadth of outlook of the volume would have been increased by the inclusion of a larger amount of the work done by investigators of other nations. The authors have avoided this temptation.

Much of the medical zoology and other matter might have been dealt with in an appendix, as has been done, with advantage, in MANSON'S textbook. The text is rather overloaded by the wealth of zoological detail, and this, to some extent, distracts the attention from the account of the clinical symptoms, diagnosis and treatment. An appendix would also have admitted of fuller treatment of these.

In dealing with the diagnosis of kala azar more details are required in the description of the operation of spleen puncture in order to avoid accidents. Regarding the antimony test in kala azar the name of the discoverer is CHOPRA, not Chopras. It would have been desirable to have referred to LLOYD'S recent work on protein fractions of the blood serum which has an important bearing on the diagnosis, prognosis and treatment of kala azar.

No account is given of the recent valuable work of FLETCHER and his colleagues on tropical typhus in Malaya.

The recent work of ROGERS on the epidemiology of cholera is not alluded to, nor is the question of pilgrim traffic discussed, although it is a most important factor in the spread of cholera in India.

The interesting disease known as rhinosporidiosis is very briefly referred to, and no details regarding the parasite—not even its name—are given.

In some parts of the volume the type is very small and reading is very trying to the eyes. It is well illustrated mostly from photographs.

The book contains much useful information and sound advice. To those familiar with the German language it can be recommended as a reliable guide to tropical medicine and hygiene.

E. D. W. Greig.

HOEPPLI (R.), HSÜ (H. F.) & WU (H. W.). **Helminthologische Beiträge aus Fukien und Chekiang.** [Helminthological Contributions from Fukien and Chekiang.]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1929. Vol. 33. No. 1. pp. 1–43 [1–43]. With 15 text figs. & 12 plates.

This valuable contribution to comparative helminthology is divided into three parts : the first is a study on the host reactions to certain parasites, the second a description of some new species of nematodes (mostly bird filarias, but including a new species of Onchocerca, *O. fulleborni*, from the connective tissue round the vagina of a porpoise) the third a description of some new free-living nematodes. The two last parts contain little of human interest. The first part, however, although it describes no lesions caused by human parasites, is of considerable medical importance. The writers have studied a variety of nematodes and flukes (including Spirocerca from the stomach of the dog, an ascarid from birds, one of the gape-worms and a fluke related to Paragonimus). In most cases they find that the parasite causes an inflammatory process in the host with the production

of cell-infiltrations (poly- and mono-nuclears mostly) and a certain amount of tissue destruction. In some (e.g., Spirocerca and the fluke) encapsulation is found. These host reactions are generally accompanied by an eosinophilia—a notable exception being Spirocerca in the stomach and aorta of the dog.

The writers have also studied histologically the food of the worms. Spirocerca feeds on polymorphonuclear leucocytes and red cells, Tetrameres (in birds) on the secretion granules of the glands of the alimentary tract; the fluke feeds on leucocytes—including eosinophiles—while the gapeworm sucks blood from the wad of tissue in its mouth capsule; the ascarid, on the other hand, secretes a fluid which digests the tissue around the mouth opening and absorbs this material.

The paper is well illustrated with photographs and drawings, and is an addition of outstanding interest to the neglected subject of helminth pathology.

T. W. M. Cameron.

PATTON (Walter Scott) [M.B., Ch.B. (Edin.), F.E.S., Dutton Memorial Professor of Entomology, Liverpool Univ. & Liverpool School of Trop. Med.] & EVANS (Alwen M.) [D.Sc., Lecturer on Entomology, Liverpool School of Trop. Med.]. **Insects, Ticks, Mites and Venemous Animals of Medical and Veterinary Importance. Part I.—Medical.**—pp. x+785. With frontispiece, 374 text figs., 60 plates, 3 maps & 1 large illustrated revision sheet. 1929. Published privately & obtainable only from the Entomological Dept., Liverpool School of Tropical Medicine. [20s.]

Mr. Kipling's Neolithic poet, provoked by critics to homicidal fury, was informed by a soothing nocturnal apparition that

> " ' There are nine and sixty ways of constructing tribal lays,
> And every single one of them is right ! "

Be that as it may, the method of " constructing " adopted by the authors of the volume before us has been to reprint *in extenso*, and in serial order, the instruction imparted by the twenty-eight lectures, followed by demonstrations and laboratory work, forming the course for the Diploma of Tropical Medicine given by them at Liverpool. A system of book-making such as this in a work of reference, which, as we are told by the senior author in a printed slip inserted in the copy submitted, " replaces Patton and Cragg's ' Textbook of Medical Entomology,' which is now out of date and out of print," has obvious drawbacks. To mention only one: in order to discover all that is known and stated about a given insect, it is often necessary in the present instance to consult a number of widely separated pages, and many scattered illustrations. To a reader accustomed to the straightforward methods followed in ordinary entomological text-books, the result is bewildering. In their Preface (p. v), the authors state that the work has been written " primarily " for " medical officers and others taking post-graduate courses in Tropical Medicine," yet they admit that " the book contains far more than the medical officer requires to know of the subject, from the standpoint of the examination for the Diploma of Tropical Medicine . . . " A little further on, to our astonishment, we read that the book " has been primarily written for the medical officer approaching the subject for the first time " ; were this really so, alarming-looking terms such as " mesanepisternum," " meskatepisternum "—not often used, even by professional entomologists—might well have been omitted from the legends to certain figures. Without in any way desiring to belittle the importance of Medical Entomology, we venture to think that a medical man, who practises his profession either in the tropics or at home, can never hope to be " primarily " an entomologist; a certain lack of sense of proportion on the part of the authors therefore seems

evident, and it would have been kinder to the tyro to endeavour to impart knowledge in smaller doses. On the following page the authors write : " The second, and perhaps the most weighty reason for writing this book is, to make available in handy form not only the essentials of the subject, but a great deal of more detailed information which is at present neither available in books on entomology, nor even in papers on the subject." The reasons given by the authors for including " more detailed " information of this kind leave the reviewer unconvinced ; he still considers that its proper place would be in an advanced text-book on general entomology, or in papers published in scientific journals ; and since the volume with which we are dealing weighs some 4½ lb., its " handiness " is open to question. The authors would seem to some extent to have been carried away by their enthusiasm; the statement (Preface, p. viii) that the Liverpool School of Tropical Medicine possesses " *unique* (reviewer's italics) collections of mosquitoes, midges, Tabanidae, myiasis-producing Diptera, and their larvae, as well as fleas, mites, ticks,etc." is evidence of this.

As is only natural, the greater part of the book under consideration—some 500 pages, including, in addition to morphological and anatomical details, valuable notes on bionomics and, wherever possible, control—is devoted to the Diptera. Fleas, bugs, ticks and mites occupy some 184 pages ; but poisonous snakes, although a figure of an Indian cobra is stamped upon the cover, are, like scorpions, dismissed in a single page. The book is packed with information, and well and copiously illustrated ; but there are no lists of either contents, figures or plates.

A few obvious misprints have been noted but, in a work of such magnitude and covering so wide a range as the present, to point them out would be mere hypercriticism. The authors, however, are guilty of certain errors which should not be allowed to pass uncorrected, and some of which may be mentioned here. Thus, in taking it upon themselves to ignore the frontal (ptilinal) suture as a character of major taxonomical value among the higher Diptera, with the result that they actually include the Syrphidae (Hover-flies) among the Muscidae Calypteratae, they are basing a reactionary conclusion upon a premise which is false. Again, in stating that the Diptera commonly grouped under the designation Pupipara " are erroneously believed to deposit a pupa," Prof. Patton and Dr. Evans are themselves mistaken ; that the so-called Pupipara are in fact larvi- and not pupi-parous has been known to all Dipterists for a very long time. Moreover, in treating the Hippoboscidae in a similar manner to the Syrphidae (*vide supra*), the authors have taken a course to which we think few entomologists will assent. *Pace* Miall and Hammond and the present authors, the term " Harlequin flies " is not a vernacular designation of the large harmless midges of the genus *Chironomus ;* and (in spite of the late Prof. Maxwell Lefroy) *Fannia scalaris* is not " popularly known as the ' latrine fly.' " In their account and figures of the African Floor Maggot fly (*Auchmeromyia luteola*), the authors strangely enough have confused the sexes, the characters given for the male abdomen really applying to that of the female. Lastly, in treating of lice, the incorrect and meaningless form " Anopleura " is used (pp. 541, 542, 551), instead of Anoplura—the original and correct name of the order to which these insects belong.

E. E. Austen.